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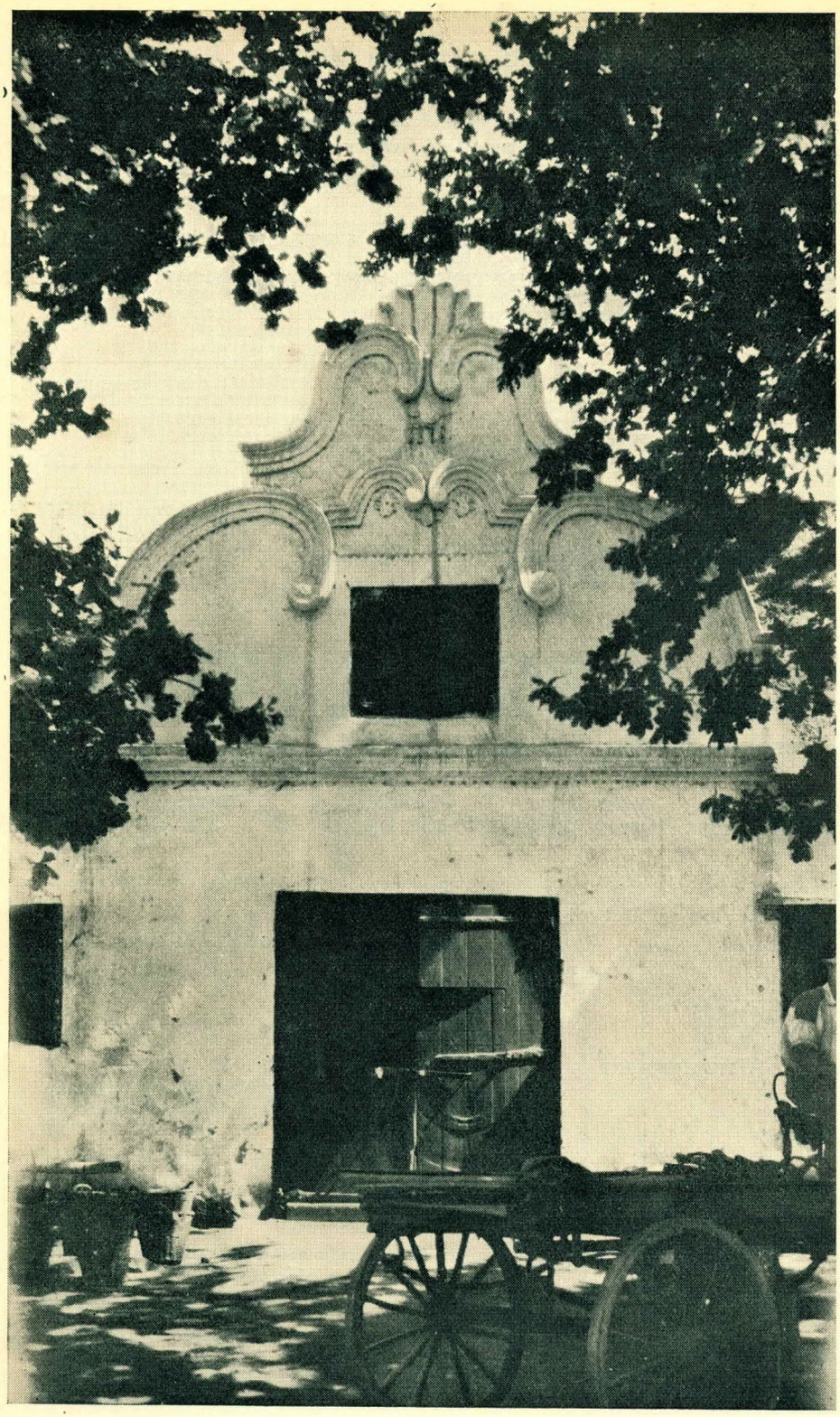


Photo by N. Hanson.

Wine Cellar near Stellenbosch, erected A.D. 1771.

THE SOUTH AFRICAN ARCHITECTURAL RECORD

Vol. XV. No. 59. SEPTEMBER, 1930.

MODERN STAGECRAFT AND THEATRE CONSTRUCTION.

by PERCIVAL R. KIRBY, M.A., F.R.C.M.

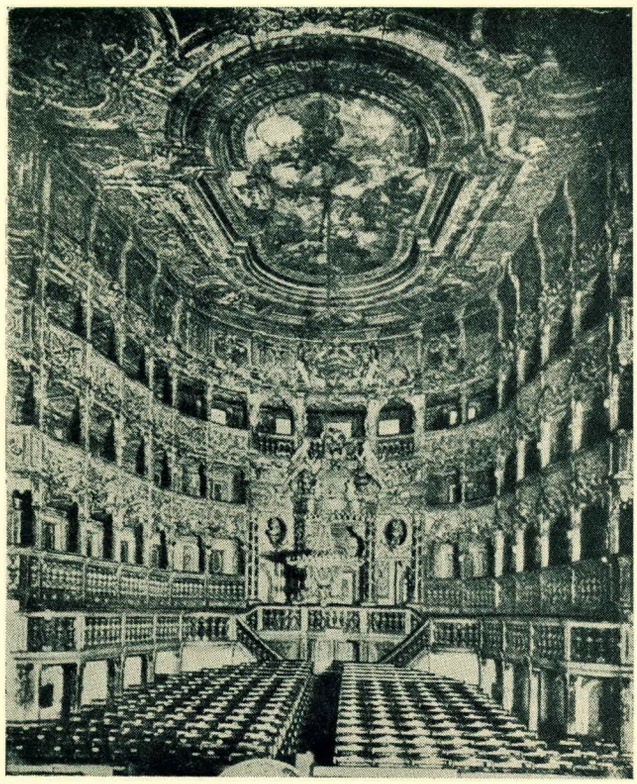
PROFESSOR OF MUSIC, UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG.

Clive Bell has defined Art as "significant form," and has amply justified his definition by many powerful arguments. Applying this definition to the art of the theatre, one is naturally led to the conclusion that every device which will add to the significance of a stage work as an art form, must necessarily be of great value. At any moment in the course of a dramatic performance, one should be beholding a picture, and consequently, it has occurred to the modern thinker that, logically, the principles used by an artist in creating a sincere work of pictorial art should be applied to the creation of stage pictures. In addition, architecture, painting, lighting, gesture, music, and every other possible means should be used, and correlated in such a way as to obtain the maximum artistic effect in a drama. But it must be pointed out that irrelevancies should be rigorously excluded, for, as Clive Bell has further indicated, realism, as such, is in works of art irrelevant, except in so far as it assists in increasing the significance of form of the art work.

Such a conception of the art of the theatre is essentially modern. Formerly the arts were regarded as merely accessory to literature in the theatre. We now consider that a synthesis of all the artistic forces is the ideal to be aimed at. Richard Wagner, in the nineteenth century, realised this to the full, and his extensive writings on the subject were prophetic, though, owing to the relatively crude state of the appliances to be found in the theatre of his day, he was unable to put his ideas completely into effect. To-day, modern appliances of all kinds are at the disposal of the stage, and there would appear to be no limit to the artistic possibilities that are open to the sincere theatre director. But the deadweight of tradition, coupled with the fact that most theatres are of necessity commercial, has prevented the universal artistic development of the stage that one would have hoped to have seen in modern times.

A brief survey of the evolution of the art of the theatre will explain more clearly why this is so, and why in particular, theatre architecture has lagged behind. For this is a democratic age, and yet the design of the majority of our present-day theatres, always excluding cinemas, remains aristocratic in conception. The earliest dramas were undoubtedly acted in the open air, preferably at the foot of some suitable hillside, on which the spectators could be seated conveniently. Nature supplied the stage setting, which remained virtually the same for all types of performance. The Greek theatre was, one might say, a highly conventionalised hillside, from which all spectators in the then democratic audience could obtain an excellent view of the drama. But the size of the auditorium, and the nature of the "stage" was such as to preclude any attempt to create illusion except by purely literary means, save for the adjuncts of masks, costumes, simple "properties" and so forth. Moreover, although the Greek theatre was in general democratic, one can observe the beginnings of aristocratic dominance in the fact that special "front seats" were reserved for the priest of Dionysus and for state officials. An analogous state of affairs can be observed in the early Japanese theatre. In the Middle Ages the ecclesiastical drama presented similar features. Many of the Mystery plays were given not only in cathedrals, but also as pageants upon movable stages in the open air. Here again, the settings and appurtenances were relatively unimportant, the emphasis being laid on the literary side of the work, although at times, music played a vital part in the conception of the drama, as in the case of "God's promises," and in that of certain of the Nativity plays. Secular dramas in these days were however often played upon a portable stage, set up in the courtyard of an inn, and some of these inns still survive. The inn yard was quadrangular in shape, being surrounded by rooms, and having an open gallery running round it,

on to which the rooms of the upper floor opened. The richer members of the audience looked down on the performance from their "dress-circle," or, if one cares so to describe the rooms, from their "boxes," while the poorer people crowded round the stage itself in the yard, which we may style the "pit." The design of the Elizabethan theatres was suggested by this practice. The stage had by this time definitely entered upon a commercial career, and any system whereby increased takings might be ensured was welcomed by actors and playwrights alike. Besides, as I have pointed out, tradition was then, as now, very strong. The drama was still conceived as principally a literary work of art, although attempts were made to add to its force by the elaborate use of music, as in Shakespeare's "Tempest" and "Twelfth Night," and in Beaumont and Fletcher's "Knight of the Burning Pestle." Such use of music was often intended to appeal more to the "lowbrows" in the audience, than to the musically cultured. Occasionally crude pictures were painted on the traverse curtains which at times closed in the "rear stage." The audience practically surrounded the stage, the common people standing or sitting in the "pit," while the gentry occupied the three tiers of galleries that ran round the whole structure. The gallery seats behind the stage were considered the most desirable, a fact which may explain the inflated prices of the "stage boxes" of our present day theatres.



The old opera house at Bayreuth. A typical opera house of the old style in which the design has been powerfully influenced by social considerations.

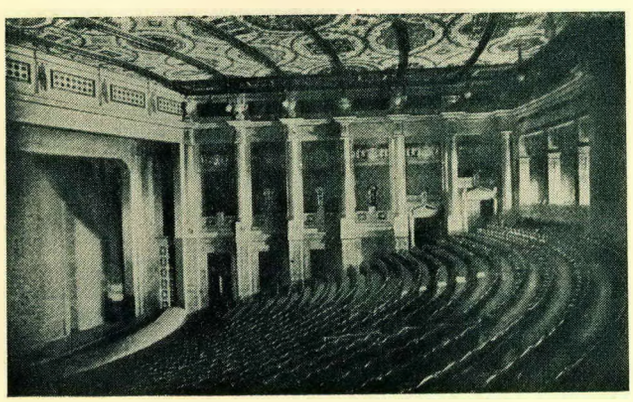
From "The Theatre of Today." by Moderwell.

As the seventeenth century advanced, theatre design gradually changed. The development of Italian opera, originally an aristocratic luxury, and the final developments of the masque, brought into the theatre the use of spectacular stage settings, which, when one considers the means available at the time, were quite elaborate ; and these in turn necessitated the introduction of the "picture-frame" proscenium. But, although the theatres and opera houses were now public buildings, the tradition of the aristocratic boxes (which had even crept into ecclesiastical architecture) remained, and the theatre with a picture frame proscenium and a horse-shoe auditorium, plentifully supplied with boxes, was the result. The stage setting could not be viewed adequately from the side boxes, but this was of comparatively little importance, since the theatre was principally regarded as a fashionable amusement. The design of the building was such that one could see and be seen. The audience was a pageant. The gibes of Addison, Gay, Fielding and Sheridan bear ample witness to this fact. So also do the descriptions of Covent Garden performances in the society papers of to-day. The theatre had gradually become a social rather than an artistic institution, and this fact dominated theatre architecture so powerfully that, as I have pointed out, its results are still apparent. The majority of our present day theatres and opera houses are quite unsuitable for the adequate presentation of a drama as conceived by a modern stage craftsman, and this fact is very noticeable even in those great Continental theatres in which the stage arrangements have been completely modernised, but in which the auditoria have, for old sake's sake, or for commercial or social reasons, been left untouched.

Modern theatre design may be said to have started with Richard Wagner, though I am inclined to think that he owed his conception of the Bayreuth Festival Theatre to the ideas promulgated by the French composer Grétry in his Essays on Music, published by authority of the Committee of Public Instruction in the month "Pluviose," of the year V of the Republic (1797). From the third volume of this work, I quote the following passage, in which the author gives a description of his ideal theatre. "I would have," he says, "the auditorium small in size, to seat not more than one thousand people. There should only be one kind of seat for all ; no boxes, whether large or small (except one only which should be concealed, in which the authors of a new work might sit during the first performance ; this should be furnished with a table, lights, and writing materials, so that defects of the presentation might be noted down and afterwards remedied). I would have the orchestra entirely concealed, so that one could see neither the musicians, nor the lights on their music desks. The effect would be magical, for one knows that in all cases, the orchestra is not supposed to be there. I believe that a wall of hard stone is necessary to separate the orchestra from the theatre, so that the sound may be reflected into the auditorium. I would have the auditorium circular, arranged in steps, each seat comfortable, and separated from its neighbours by light lines of demarcation of about an inch in width, as in the theatres of Rome. From the orchestra the steps would rise in the form of a circular amphitheatre, always ascending, with nothing above them except some trophies painted in fresco. I would have the whole of the auditorium painted in brown, or in some single colour, except the trophies." This would almost serve as a description of the Wagner Theatre at Bayreuth.

The design of the modern German theatre as conceived by Wagner, and carried out by Max Littmann and others more recently, is based on the principle that a theatre is a building wherein a play, not an audience, is to be exhibited. Therefore, everyone must have a clear and direct view of the whole stage ; there must be no galleries, boxes or pillars ; acoustics must be above reproach, and also ventilation ; and no sounds extraneous to the performance must be allowed to reach the auditorium. Elaborate decoration is unnecessary, though beauty of design and ornament is desirable, and must arise from the nature and function of the building. Such a theatre is democratic in principle, and in it the maximum artistic result is obtainable, provided that the stage arrangements and the artistic ideals of the director are also adequate. Unfortunately, commercial and social considerations, the relative lack of sympathy with artistic productions among the public at large, and the cost of scrapping and replacing costly existing buildings (not to mention the sentiment attached to them), have militated against the universal adoption of this kind of theatre. The modern cinema, however, which is much more democratic than the average theatre, approximates fairly closely to the type of theatre conceived by Wagner.

I have already shown how, in the early days of the theatre, stage settings, when they existed at all, were comparatively simple. With the advent of the "picture frame" proscenium in the Stuart period, painted backcloths, "flats" running in grooves to mask the "wings," and unconvincing "borders" to hide the flies, began to be used, and, since plays were by this time acted indoors (the Elizabethan theatres were open to the air), artificial lighting became necessary. Stage settings, though often quite elaborate, were usually very conventional. In fact, the author of a play generally contented himself with making the barest suggestions to the scene painter, who only concerned himself with supplying something which fitted in with the general hints given him. The following are a few scenic descriptions taken at random from eighteenth century plays—"A Room in an Inn," "A Cottage," "The Park." Frequently the author-producer did not know what was to be supplied in the way of scenery until just before the production ; often the necessary conventional "set" was supplied from stock. Sheridan has

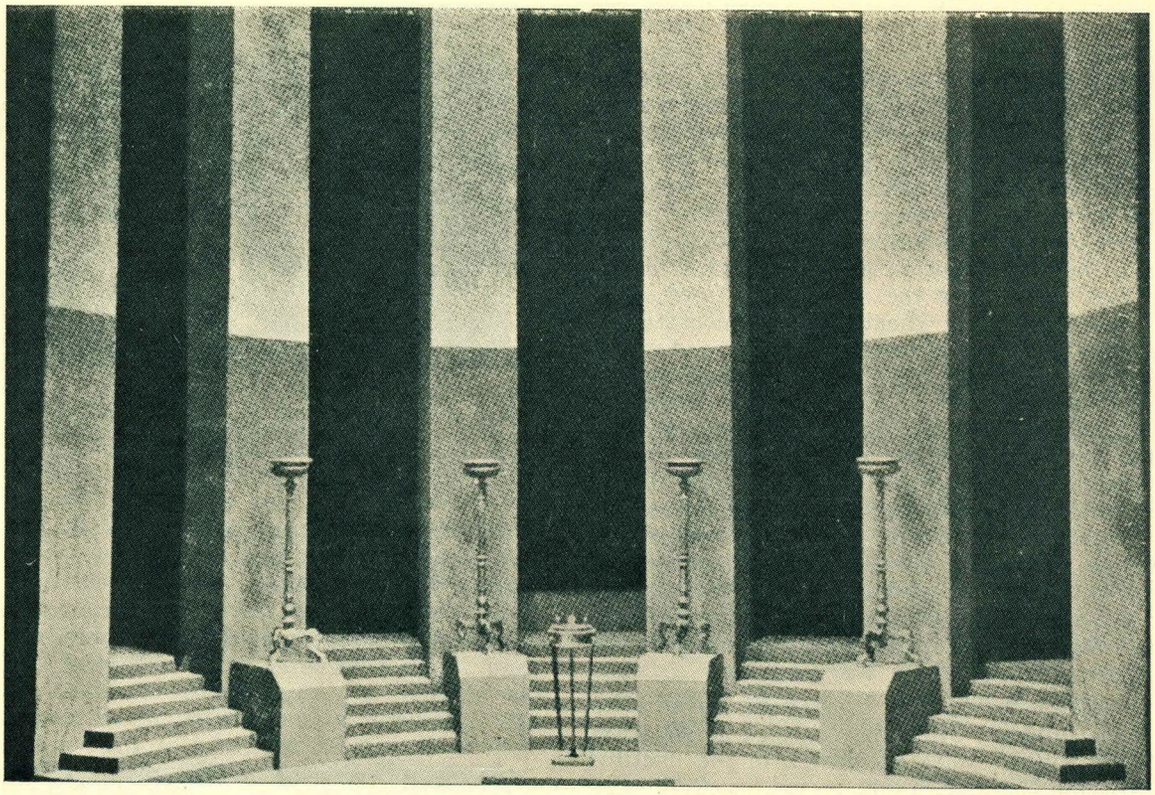


The Prinzregenten Theatre, Munich. A modern opera house in which the principles laid down by Richard Wagner have been observed. *From "The Theatre of Today" by Moderwell.*

"And in this tomb were found." A striking example of the use of the "Silhouette scene" in the Cambridge Festival Theatre. *From "Modern Stage Lighting" by Ridge.*

immortalised this practice in Act II of "The Critic," when Puff, the author of the play within the play says, "Then up curtain, and let us see what our painters have done for us." Moreover, stage furniture was generally manufactured from lath and canvas, and if trees were called for, "cut cloths" supported by strawberry netting were requisitioned. Practically all lighting was from the front, as its prime function was to illuminate the faces of the actors. Attempts at realism, produced in the nineteenth century, stage pictures in painted perspective which were often quite beautiful until the actor came on the stage, when he completely shattered the illusion. The lights that render the actors' faces visible, usually served also to illuminate the backcloths thus, variation of distance brought about by variation in lighting was impossible, and the actor cast illusion destroying shadows everywhere whenever he moved. Painted perspective is, moreover, only really effective from one point in a theatre.

Modern Continental stagecraft has produced a new type of stage control. Under this system, the director, literally controls the entire production, and is not, like many English producers, primarily concerned with the acting. Specialists, working under him, see to the various branches after detailed discussion. The director correlates the whole. In this we see the influence of Gordon Craig and others. Craig believed in the synthesis of the artistic forces in the theatre. He said "Do not look first at Nature ; look in the play of the poet" ; his writings on stage design and his personal practice has had very far-reaching effects, especially on the Continent. In Germany, Adolph Appia wrote a work on "Music and Stage Settings," in which he attempted to deduce from the Wagner music dramas the proper type of settings for them. He anticipated much modern work, although the Wagner tradition prevented him from completely carrying out his ideas. Settings, according to Appia, must adequately establish the right atmosphere for the actor. Existing perspective and lighting were all wrong. The stage must be three-dimensional. The way in which this could be done was to be found in the proper use of light, which he maintained was the "spiritual core, the soul of the drama." Light, properly used, showed the actor to be a plastic and flexible body of three dimensions. Stage settings must suggest the



A significant plaster setting for the "Gyges and his Ring," of Hebbel.

From "Twentieth Century Stage Decoration," by Fuerst & Hume.

atmosphere, and not the reality of the things they stood for. In all the productions Appia planned, every detail of lighting, and every position of the actor, were worked out in conjunction, and his stage pictures were invariably of great artistic beauty. Rational lighting should give rational shadows; in the old theatres where light was chiefly front light, shadows were unreal, and, if possible, eliminated entirely. From the modern point of view, footlights, as such, are bad, and must be dispensed with. The so-called "full" lighting is a mere convention. It necessitates elaborate make-up, it is entirely opposed to natural light, and it cannot create illusive beauty, such as was aimed at by Appia. In the recent production of Ibsen's "Vikings at Helgeland," at the University of the Witwatersrand, an attempt was made to apply Appia's principles in respect of lighting. The rising sun in Act I, cast long shadows, the cold light of early morning which accompanied the strife in the beginning of the Act gradually giving place to bright daylight as the Act ended in a spirit of welcome. And in the Second Act, the glare of the firelight in the great hall threw tall vertical shadows of the characters on the walls that seemed to presage the apparition of the Warriors riding to Walhalla during the storm in Act IV. The whole scheme is to be found, as Craig said, "in the play of the poet," and it is difficult to see how anything like an adequate illusion could be created without the aid of modern lighting.

Three-dimensional scenery has been made possible by the invention of the "cyclorama," or artificial horizon. This is a curved wall or dome of plaster or canvas, generally painted white, which entirely encloses the back of the stage. It is usually about double the height of the proscenium arch. The cyclorama is illuminated by a powerful battery of coloured lights. It can be arranged so as to give the impression of a natural sky, or it can be illuminated in a conventionally decorative manner. Further, by using the modern cloud machine, natural clouds may be made to move across the artificial sky in any direction and at any speed. Powerful optical lanterns may also be used, even when the cloud machine is in action, for projecting distant landscapes on the cyclorama. Since the transparent slides used for this purpose are photographed from nature, and coloured, extraordinary perspective values are obtainable, and a real sense of distance can be achieved.

The switchboard used for operating the stage lights in the modern theatre is an exceedingly complex structure. All circuits are fitted with "dimmers," which may be operated either by hand or by motors, whether singly or in groups; or the entire lighting of any scene may be dimmed as a whole. This switch board is frequently placed below the centre of the front of the stage, so that the electrical artist (for he is no longer a mere electrician) may see the whole of the stage through a narrow opening in the modern equivalent of the "floats," and may "paint" his picture with full knowledge of what he is doing.

The general principles of modern stage lighting require that all sources of light should be concealed, that all shadows should be as natural as possible, and that front lighting should be so planned that it does

not kill the horizon lighting. To achieve the latter, the acting area lights must be arranged so as not to strike directly on the cyclorama; and in like manner, the footlights must be directed so that the direct light from them just misses the top of the cyclorama. Side lighting must be thrown diagonally across the stage for the same reason. The cyclorama should therefore be from ten to thirty feet from the back of the acting area, whatever the depth of the latter may be. The further it is from the acting area, the easier it is to achieve perspective in lighting, and also to project clouds or scenery successfully.

The proscenium opening itself has also undergone a transformation. Within it is a "false" proscenium, above which is placed a "lighting bridge" on which is mounted the majority of the lamps used for illuminating the "acting area," where most of the stage action takes place. This false proscenium is so made that it can be reduced in size, both as regards width and height. This enables small settings to be used, and avoids the absurdity of a garret scene in one play being as spacious as an Egyptian temple in another.

The lead has been taken in all these matters by the great German theatres, and performances such as one sees in the state theatres of Berlin, Munich and Dresden are exceptionally beautiful. There is, however, evidence that both the knowledge of what can be done, and the desire to do it is spreading, and we look forward to the day when, at least in the more serious drama we may regularly witness a genuine synthesis of the arts.

ARCHITECTURAL COMPETITION FOR PROPOSED NEW CENTRAL FIRE STATION, JOHANNESBURG.

Thirty-six designs were submitted for this competition, the assessor being Mr. E. H. Waugh, A.R.I.B.A., City Engineer of Johannesburg, who made the following awards:

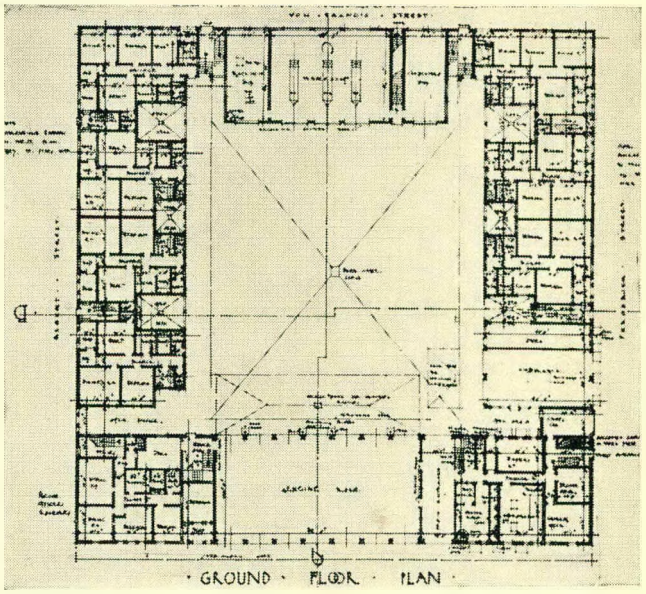
First premiated design: Mr. C. Small.
Second: Messrs. Kallenbach, Kennedy and Furner.
Third: Mr. P. E. Treeby.
Fourth: Mr. H. G. Ward.

Owing to the somewhat short notice which was given of the exhibition of the drawings and the fact that the exhibition was closed at four o'clock each afternoon it was not possible to study all the drawings in detail nor to arrange for a full criticism to be written on the designs submitted.

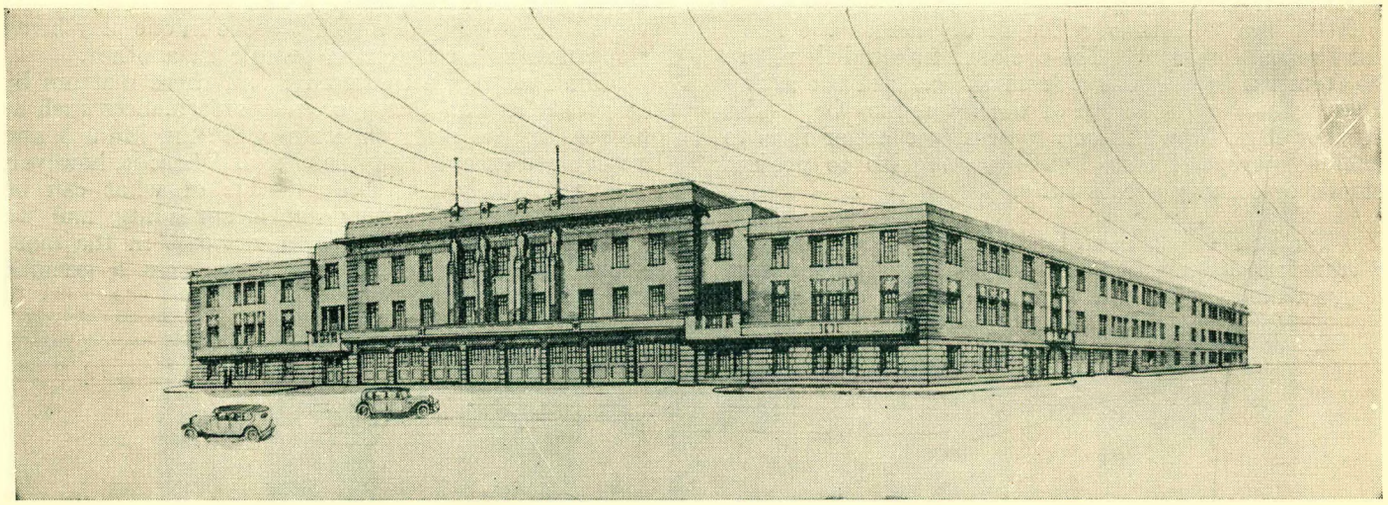
It seems unfortunate that competitors were given a diagrammatic plan showing a general arrangement of the scheme. This must naturally have hampered them to some extent and probably prevented any scheme being produced showing individuality or originality in plan.

In spite of the fact that Competitors were at liberty to alter or improve on the diagram they were faced with the problem as to how far they dared vary from the scheme outlined.

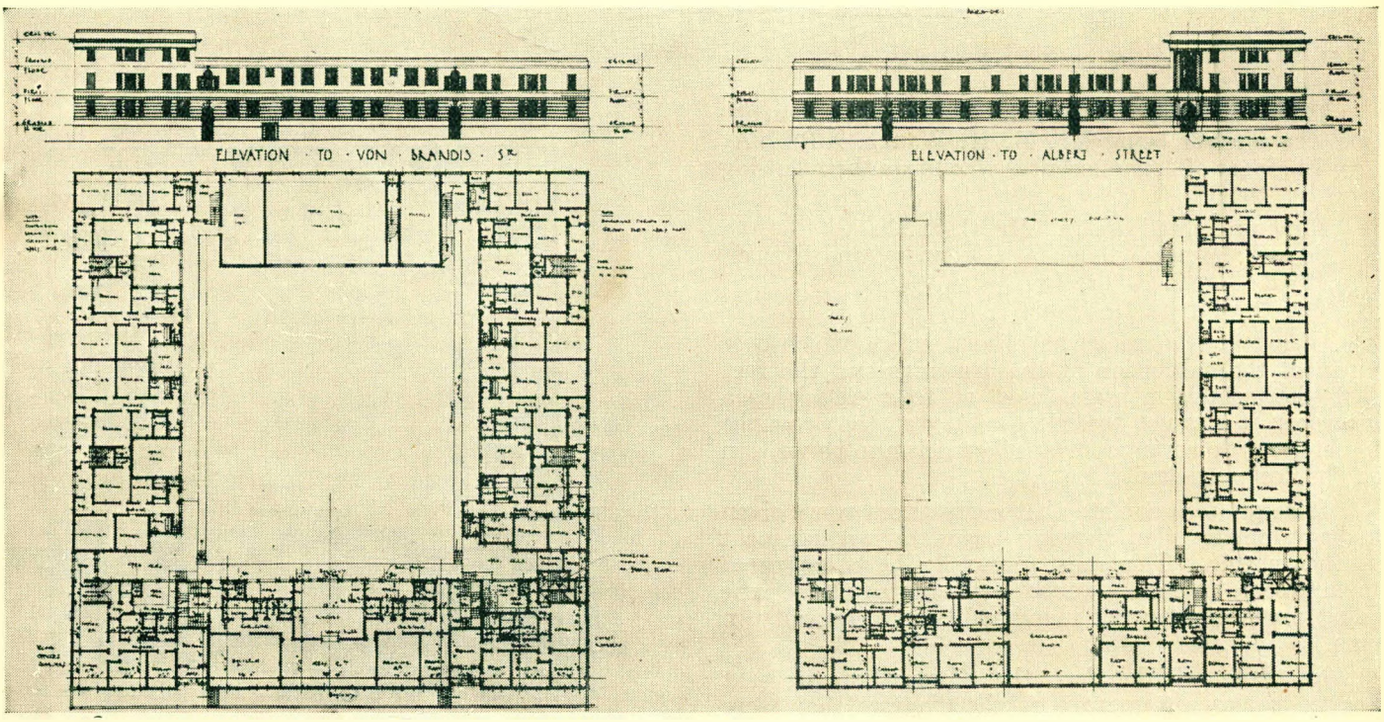
The designs submitted therefore consisted of slight variations in planning, but considerable variety in elevational treatment. A general but somewhat cursory glance at the drawings exhibited gave one the impression that the standard of architectural design, with the majority of the competitors, was decidedly poor. Few clearly expressed the purpose of the building and the majority appear to lack a knowledge of those essential qualities underlying good architectural design. The assessor reported as follows:



1st Premiated Design. *C. Small, Architect.*

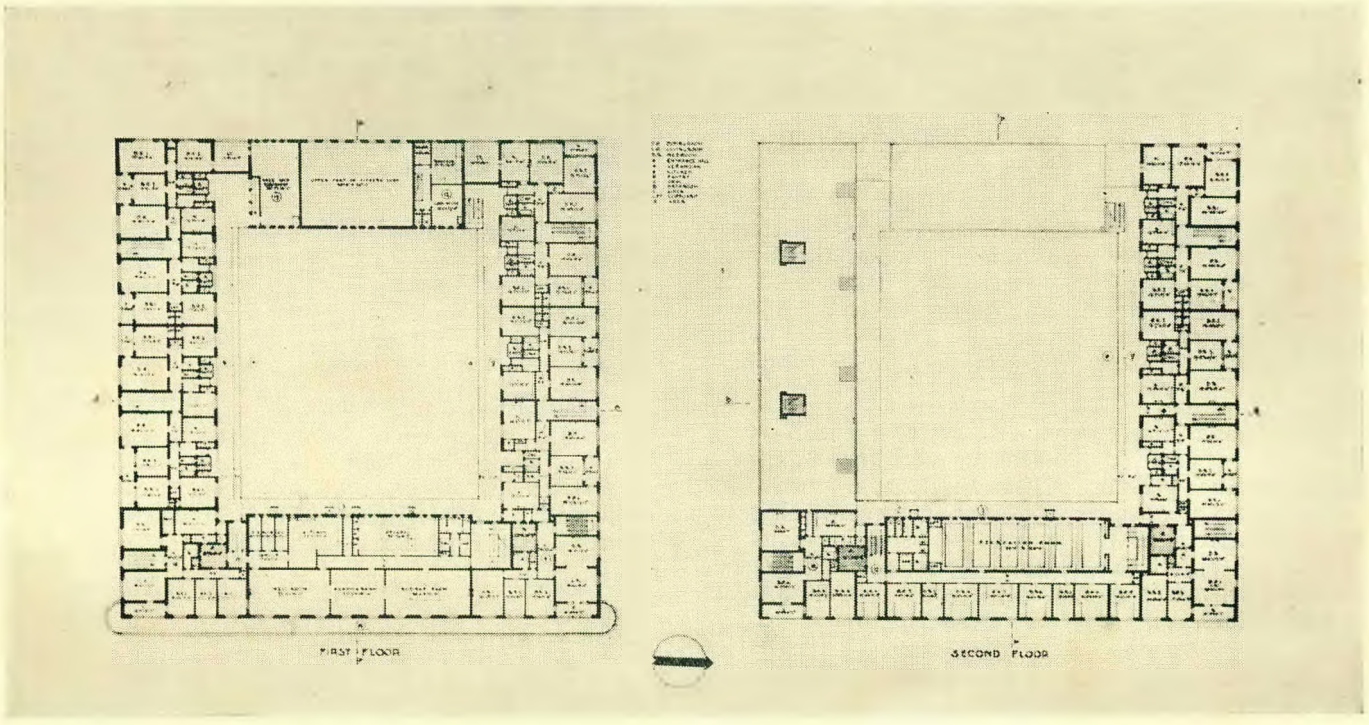


1st Premiated Design. *C. Small.*

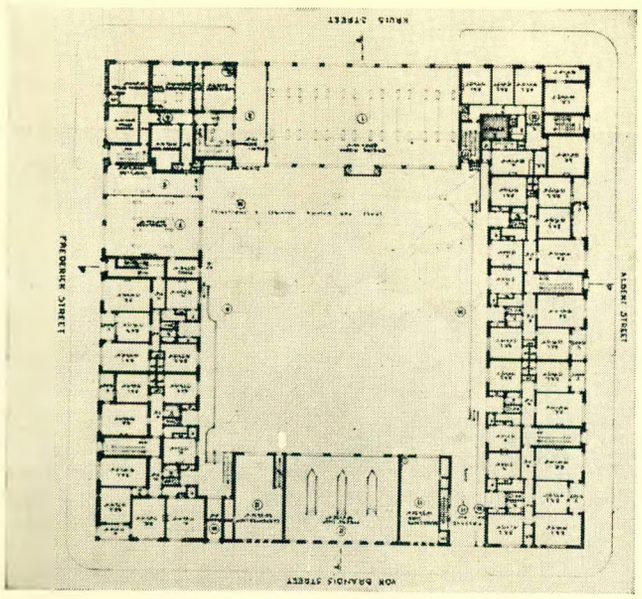


1st Premiated Design. *C. Small.*

2nd Premiated Design. *Messrs. Kallenbach, Kennedy & Furner.*



2nd Premiated Design. *Messrs. Kallenbach, Kennedy & Furner.*



2nd Premiated Design. *Messrs. Kallenbach, Kennedy & Furner.*

P.O. Box 1049,
Johannesburg.

The Town Clerk,
Johannesburg.

Dear Sir,

ARCHITECTURAL COMPETITION FOR PROPOSED NEW CENTRAL FIRE STATION, KRUIS AND VON BRANDIS STREETS, JOHANNESBURG.

I have to report that thirty-six sets of drawings were received and opened in my presence, each drawing and report in each set numbered, and the sealed envelopes containing the competitor's name similarly numbered, and handed to Mr. Marks, of your Department. The Assessor consulted the Chief Officer, Fire Department, on matters re suitability for his Department.

The designs, generally, display a high level of merit. A general plan indicating what arrangements would suit the working of the Fire Department was issued by the Council, competitors, however, being at liberty to alter it or improve on it. In the main, as regards the engine room and appurtenant chambers and workshops, this plan was generally found suitable by competitors.

The married firemen's quarters and flats presented evidently the greatest difficulty in planning to competitors, more especially on the internal parts of the four corners, and indeed, formed the chief labour in endeavouring to select the most suitable design.

No. 22 gives the most open plan for light and air especially in view of the shadowing effect of the rear ten foot balconies, but the kitchens are in some cases on the small side. This, however, can be improved in the final plan. For the Fire Department's working, the plan is suitable, and also the large apartments for men's messing and recreational use. The author states his estimate at £70,000. No figure of cost was issued by the Council. The Assessor accepts this figure. Many competitors stated less, but the Assessor was not able to accept many of these estimates as they were too low.

The height of quarters and other portions in this, and in fact in many other plans, are in excess of what is really necessary, and considerable reduction in cost can be made by attention to this aspect.

The elevations are dignified and of merit, and suitable to the purpose.

The Assessor finds that the order of selection for awards should be as follows:—

(1) No. 22 (Receives sum as set out below).
(2) No. 13 Premium of £350.
(3) No. 25 Premium of £250.
(4) No. 17 Premium of £150.

Under the Conditions (Clause 6), the author of design placed first receives an amount of ¾ per cent. of the estimated cost, immediately the premiums are paid to the other selected designs, as per Clause 7, viz.:
¾ per cent. on £70,000 .. ..£525

such sum to form part of his ultimate commission, under Clause 4 and adjustable subsequently to cost of executed design.

The sealed envelopes now require to be opened in public, and, subsequently, the Assessor shall report that he is satisfied that there is no valid objection to the employment of the author of the design placed first, and that he is satisfied that the author is the *bona fide* author.

The designs and reports must, subsequent to the opening of the envelopes, be exhibited as per Conditions, and one week is suggested; notification to be given by advertisement in the local press that they will be on view with a copy of this report in the Mayoress's apartments, access from Harrison Street.

(Signed) E. H. WAUGH,
Sole Assessor.

TOWN PLANNING IN RELATION TO MUNICIPAL ENGINEERING.

by E. H. WAUGH, CITY ENGINEER, JOHANNESBURG.

The second of the Series of Lectures arranged by this Association on "Town Planning in Relation to Municipal Engineering," was given by Mr. E. H. Waugh, A.R.I.B.A., M.Inst.M. and Cy.E., on the 12th June, at the University of the Witwatersrand.

Mr. W. Bawden, M.P.C., Chairman of the Works Committee of the Johannesburg City Council presided at the Meeting.

The President of the Association, Mr. T. S. Fitzsimons, in introducing Mr. Bawden, expressed his thanks to the Principal of the University for the use of the lecture hall and remarked that it was gratifying to the promoters of these lectures to see such a large gathering at this and previous lectures.

Mr. Bawden congratulated the Association on the work it was doing and on behalf of the City Council he welcomed the advice and recommendations which this Association had put before them on various subjects. He referred to the new Town Planning Ordinance which it was expected would become law within the next three or four weeks and was a great step forward.

He referred to Johannesburg's new north road which was being laid out by the City Engineer and which it was hoped would be carried into effect in the near future.

He assured the meeting that the City Council fully appreciated the work which was being done by this Association and hoped they would be still more energetic in the future.

He then called upon Mr. Waugh who delivered the following lecture :

"The Municipal Engineer can be said to be in contact with almost every aspect of town planning which covers everything from planning and placing the smallest building to the arrangements for great traffic highways. He deals with the healthiness and safety of buildings, the safety of bioscopes and theatres and the sure exit of the spectators into the street, and the height of buildings to see that the street widths bear some relation to the height. He has also an intimate relation with the traffic officer and has to be in a position to see that street planning in the future is of such a character as to facilitate the safe and expeditious movement of traffic and pedestrians, and the proper conduct of drainage. Intermingled with these numerous utilitarian duties of guidance both to his Council and the general public, he must possess a clear grasp and understanding of what makes for beauty so that as far as he is able he may endeavour to help public taste to avoid sheer ugliness and unfitness both in the appearance of buildings and in the provision of features which will enhance the beauty and good appearance of the town not only in man-made features but in preserving natural beauties of landscape wherever possible. While a town engineer certainly cannot do as he likes, he may do much by broad sympathy and experienced judgment to assist others who are busy in building and township planning. It will thus be seen that town planning is about as wide an ambit as any one person can fill inasmuch as it touches everyone in almost every minute of his life. The only aspect of this ambit with which the Municipal Engineer does not come into close contact is the more social and living relationships of the people, and this is one with which the Medical Officer of Health is mostly concerned, for, while it may be possible to arrange buildings and streets which will give at least a minimum of convenience and good light and air, it will not be possible to prevent people of filthy habits from turning even a palace into a slum and this aspect is perhaps too much overlooked. Overcrowding of persons in houses is not difficult even in the best planned city. Further, people who throw garbage about their dwellings, shut out the light and air provided, and destroy even the fittings of their houses are not capable of being dealt with by even the most enlightened town planner, and can only be regarded as subjects for teaching and training by welfare and other such officers.

The need of control of Street Planning.

If any evidence is needed of the need of control in the planning of a city it can easily be found in all too many deplorable cases in the City of Johannesburg. In the early days before the Boer War, there was no law relating to town planning and the necessity of arranging streets to lie in such a way as to provide proper through access It is even said by some old timers that sometimes contiguous townships were planned so as not to communicate too easily and so as to actually bar any pedestrian or vehicular traffic from one to another. It is not easy to read the minds of those planners of those far-away days in making arrangements of such a nature.

The planning of Killarney and Houghton in relation to Parktown reveals such grave disability. Between Louis Botha Avenue and Riviera Road there is a distance of not less than 2,000 yards without public cross access of any kind east-west so that anyone living in the centre of Eastern Parktown wishing to visit a friend in Lower Houghton has to travel back southwards, probably to Twist Street Terminus, in order to go east, and then has to travel north before be reaches his goal—an increase of travel of at least one mile, besides the unnecessary congesting of a trunk highway like Louis Botha Avenue with what is purely local traffic and which should by definite design be arranged to travel on local routes. (Fig. 1.)

The result of these bad arrangements is that a City Engineer has to go to an immense amount of trouble to secure these needed limbs and to seriously disturb occupants of property at great cost to the town. He is then confronted with not always being able to take the best

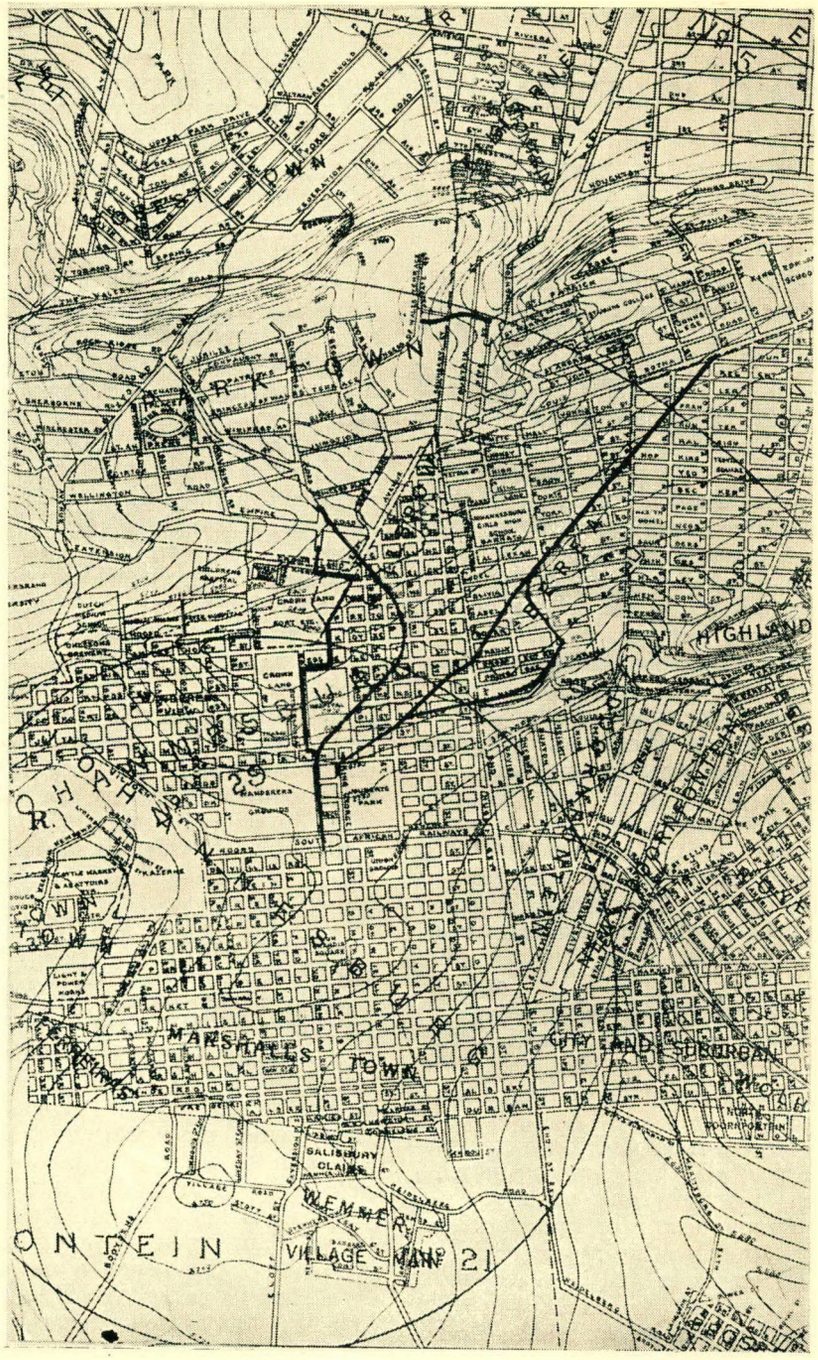


Figure 1.

route which could have been possible when the townships were first planned. The negotiations on such matters are of an exceedingly difficult and complex nature, and a City Engineer finds himself compelled to acquire a very considerable knowledge of property values and to place himself in the position of an arbiter between the general public interests and that of the property owner.

A similar problem to that of Parktown-Houghton has arisen in regard to the Fort. The history of the Fort is not generally known, but I have it on the most reputable authority that in the early days of this City, the gaol was in the vicinity of the Union Grounds —a small affair. Population, settling in this quarter, brought influence to bear on President Kruger, who came over to look for a new site, and going to the then remote and unoccupied land behind the hospital on the ridge, he chose that spot, remarking that the gaol would now be in a place where it would never worry anybody. Thus it occupies a site which would with good architectural treatment have made Johannesburg almost unique in South Africa with an acropolis close to the

city. So much for its possible appearance. But its effect on the provision of highways to the north has been deplorable, as probably £150,000 is sunk in gaol buildings and although the town holds, since 1910, the freehold of the site it is encumbered with a provision that it remains in the possession of the Prison Department for as long as it requires it for prison purposes.

Between King George Street and Harrison Street there is no way through to the north, and between Harrison Street and Vrededorp Subway, the position is the same. The scheme known in City Council quarters as the "New North Road," is an attempt to alleviate this in the former case. It is admittedly faulty, and the Council was unable to prevail on the then Minister of Justice to allow a more direct way so that it is better to take the route granted in the hope that the future will convince a future Minister that the public's need for a road is superior to the need for retention of the present gaol site. The planning of this part of the town placed roads on difficult slopes, such as Klein and Hospital Streets instead of following more easy contours and providing more ways across the railway. (Fig. 1.)

Awkward junctions of streets are only too well-known, such as King George Street and Smal Street and Bree and Harrison Streets.

Such evidence can be greatly multiplied not only to show bad junctions but also bad grades. A bad example of the latter is Appolonia Street, Troyeville. No attempt appears to have been made to take an easier route for an important line on North-South line.

These examples prove how necessary it is to have an impartial control or guidance.

In 1903, provisions of a *quasi* town planning nature were inserted in the Johannesburg Building By-Laws and all subdivisions had thereafter to be submitted and approved. On the authority of Inigo Triggs, one of the earlier town planning writers, this was stated to have been one of the first attempts at definite legislation. The worst cases happened in Johannesburg before this legislation which has at least prevented the major mistakes of the earlier period.

I have presented enough evidence to show the need of control and guidance.

The Municipal Engineer in relation to Stormwater Drainage and Sewerage.

In this relation the City Engineer performs one of his most useful functions. While traffic can manage somehow on bad grades and difficult junctions, water will have its own way and is master of the situation. Endless trouble has arisen by neglect of this axiom, and drainage has in many hundreds of cases had to be carried in awkward places across private property to the disturbance of the owner and cost to the City. I would go as far as saying that before a man plans a town he should lay down in a general way the main lines of drainage, and work his planning scheme over it adjusting the one to the other. Nor does his work cease in his own township, but he must consider where the drainage will run on to the next property below. Here the Municipal Engineer has a clear function, as he must have his eye on the whole region of which he is in charge. Water will not run uphill, unless it is pumped, and efforts must be directed to the avoidance of such arrangements.

The arrangement of roads to catch main drainage is of great importance in money saving in the future. Although at first sight paradoxical, it often pays to keep a main line along or adjoining a small spruit or watercourse both for traffic and stormwater carriage. One of the best located hill roads I know of anywhere is Loch Avenue, Parktown West, where this principle was adopted. The side roads drain nicely into it, and it forms a well placed highway without side cutting or drain troubles. Every property on each side drains into it without difficulty. Further than this, it presents a unique range of vistas. First, the near trees; a little further down, the near hills; still further down, the far hills. It would well repay study from every point in road location combining drain and traffic utility on a hillside with scenic closing at the end of each turn or bend of the street. Such a road can well be termed a backbone of a road plan in a hilly district, for the rib or side roads fall into line on either side of it. Another example is found in part of the Kloof Road, Houghton, though it is in its upper part not as well planned as it might have been, for this part could have been started from a point further west and have thus obtained an easier grade.

By following the natural flow of water in many districts, it is quite possible that this will also give the easiest grade for traffic. Something of this idea makes the main avenue in Observatory a good grade and while in that case the actual spruit has not been followed at any rate in its lower course, a good main road has been secured by adapting the road to the contours.

I am sorry to say that in much of our earlier planning this has not been always the case. I am now dealing with a case in Fountain Street, Houghton, where near the bottom, the road is planned to pass for about a length of 300 feet through a kopje fifty feet high! This gives a grade of about one in three, or even less, unless a cut of thirty feet in depth is made which would disfigure a pretty spot as well as damage the access from the adjacent lots. There are two other cases in Melville and also in Houghton where the roads are so planned that they travel longitudinally along a krantz, the south half of the road being in the upper part of the krantz or escarpment, and the north half at the bottom of the krantz and the road only about fifty feet wide and the krantz about twenty or thirty feet high. To make a road in such a case would mean a high retaining wall along the north edge thus giving no access from the stands or lots on that side to the street. Can anyone conceive of anything more fatuous than such impossible propositions?

Louis Botha Avenue presents, from Fife Avenue to Tudhope Avenue, a somewhat similar piece of work where a high wall is now being built at a total cost of £10,000, to carry a main trunk road to Pretoria. Of course, this road should have been planned before Yeoville, Berea and Hillbrow were laid out so that a route shorter and more diagonal to the present line should have been taken. In fact the main trunk routes should have been laid out from the centre City, preplanned before townships entangled the layout.

Main Trunk Routes.

Our main trunk routes which lie outside the three-mile radius follow fairly normal traffic routes which must have prevailed from the earlier days, but were interfered with by the new plan of townships being laid out.

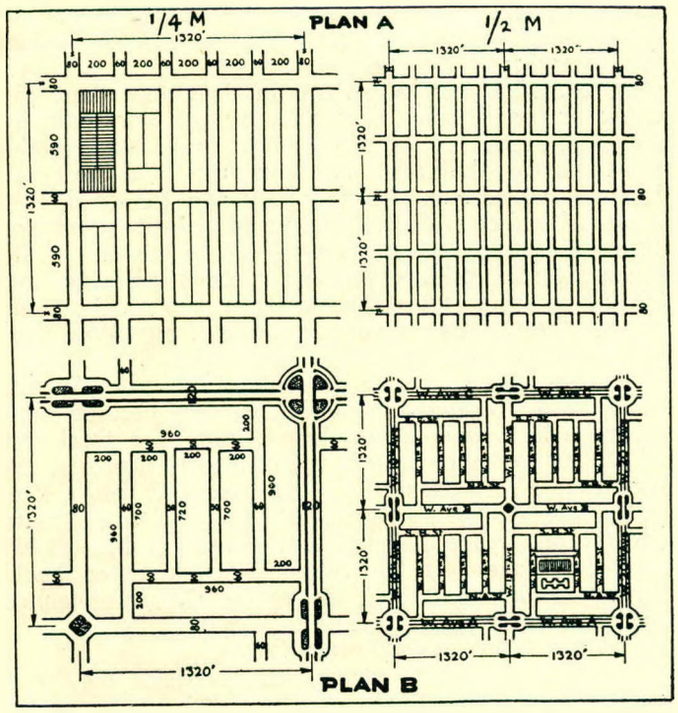
Consequently, the traffic stream Johannesburg-Pretoria when it reaches the middle suburbs has to dive about along bad grades and turnings. The same prevails with all the main lines except perhaps the Paarlshoop-Maraisburg Road which comes straight through Industria, Mayfair, Fordsburg and up Market Street and also the Kimberley Road, which, like a main trunk, reaches Commissioner Street without a right-angled turn.

This bad trunk inner layout is most felt on the north-western trunk through Harrison Street and the Louis Botha Avenue stream, as the other streams spread themselves in the inner city. The first should have been brought and spread at the western end of the inner city and the latter should have avoided the steeper grades by being inclined more to the north-east and reaching its present route somewhere near Harrow Road, north end, the adjacent townships being laid out to suit the main trunk. This might have meant a little side-cutting, but the main object would have been worth it. (Fig. 1.)

Such an easier route was obtained lately by Hadfield Terrace, only owing to Berea having been already laid out and built on at the top, it was not practicable when the road was being built last year to avoid a sharp pinch at the north end.

Parallel Routes.

In laying out lines of inner main trunk roads, it is very advisable to make them much wider than is the practice in this country. A scheme by N. L. Nussbaumer, as now adopted in the United States of America for parallel highways for trunk and local traffic is interesting. By this method, roads of from one hundred and fifty to three hundred feet are laid out and traffic to adjoining properties or side streets turns out of the main centre at intervals and thus avoids congestion at the intersections, and the main trunk centre thus becomes a moderate speedway, and is intended to be so in order to reduce the number of vehicles on the road by the expedient of encouraging speed to a considerable extent on unrestricted routes.



Plan B represents a substitute by Mr. Henry Wright for the usual gridiron plan as shown in plan A.
Figure 2, From "The American City."

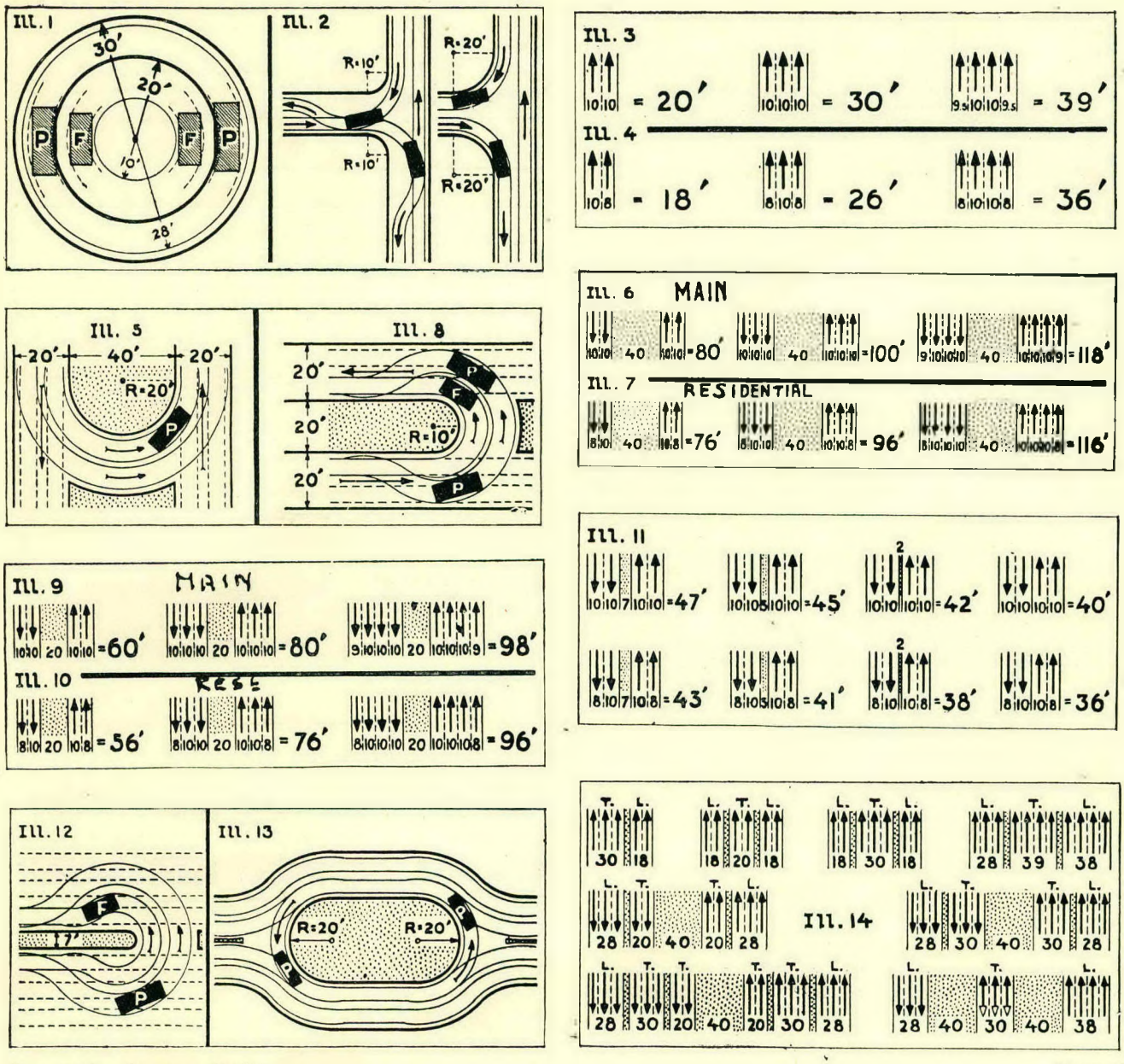
Fritz Malcher, an Austrian architect, practising in the United States of America as a Town Planner, is much sought after as a consultant on account of his method of crossing traffic without intersections such as we have them. He states that the majority of our highways, *i.e.*, trunk or main routes, do not serve their purpose, and he has devised a system whereby stream lines desiring to pass across another stream line at right angles are made to do so without stopping either stream, direct right-angle crossing being prohibited. (Fig. 2.)

The key note of this system is "one way" streets with from two to four lanes of traffic that is all travelling the same way. It practically means a total street space wide enough to accommodate two street ways on either side of a middle space which should, if possible, be twenty to forty feet wide, the latter giving a turning radius of thirty feet (including its own track or line-way on each side of the middle space) for a long car to pass across one of the one-way streets to the other. He takes a Packard motor car (eighteen feet by six feet) as an average maximum specimen of a long vehicle and a Ford (thirteen feet by five feet seven inches) as a minimum average. (See Fig. 3.)

The turning radius of a Packard is twenty-six feet four inches and a Ford seventeen feet—that is the off-side curve or the outer wheel radius. A car coming down and wishing to turn back turns out of the line of traffic and turns across the middle space and joins the opposite way street stream without interruption.

For traffic to cross from a region on one side of a main trunk route to the region on the other side, a car must join with the nearest stream lane on the main way working from that lane to the next and then to the next which places it on the lane nearest the first local cross street. It then turns round the middle space and joining in the opposing street stream and working across as before comes to the cross street and easily leaves the main stream highway. There is thus no stopping at intersections, no robots or policemen, except at some points for foot traffic, should the intensity require it. The foot passenger is greatly advantaged as the traffic stream is all one way and there is a refuge in the middle space before it crosses the opposite stream line, and only defined places as allowed for foot crossing.

The system means that a car travels a longer distance than on the grid-iron or checker pattern of plan which in America is attributed to William Penn as its first introducer, but he does it without unnecessary checks at intersection and so "safety first" is gained, risks of accident are reduced, as there is no "two stream" policy in any main road the "one stream" being the slogan just as it is on a railway where right angle crossings would be too absurd for consideration; and is not, one may ask, the fast modern vehicle of to-day making demands which can only be thus met for safety? That is by similar methods to that of the railroad so that the passing of vehicles from opposite directions is eliminated as well as the crossing of one traffic stream across another.



From "The American City."

Figure 3.

The development of this idea by Mr. Malcher is shown in the *American City,* October, 1929. It will be seen how many collision points may occur on the ordinary crossing, even with the middle space, and how these can be eliminated by leaving no crossing from one lane to another except running with the flowing stream —no backing or turning of cars across the street traffic lanes and considerable freedom for parking on both sides and provision at given spots for goods offloading. (Fig. 4.) It is shown in detail how the crossing over is done.

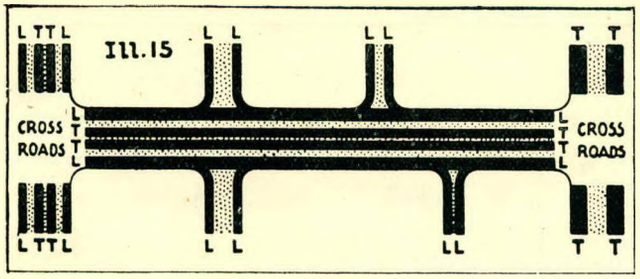
Illustrations show methods of parking easier with the "one way" stream system than the "two stream," and one illustration shows an actual street with the middle space.

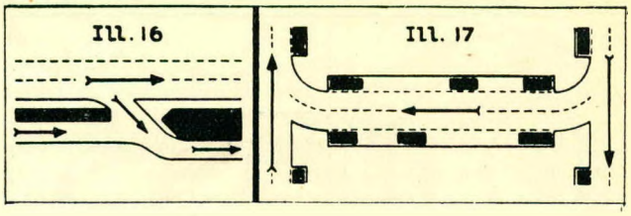
The expert mentioned (Mr. Malcher) states that it is no use constructing great highways if the traffic is to be held up at intersections every few hundred yards. It must be remembered that every stoppage of traffic at intersections crowds the street and if traffic were not stopped at all, it would never be so intense. Our local street signal method, as in most parts, is based on a system of "stop and go," or "group and gap." This means much of the street is unused for the stop period. The one stream system is intended to reduce this.

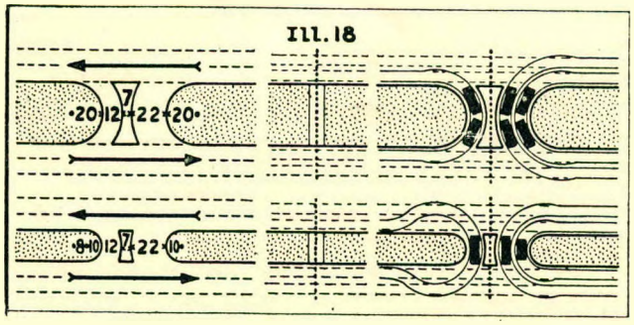
The traffic signals provide safety for pedestrians if they will only cross the stopped stream. With the uncontrolled two-stream policy in a crowded city the *American City* gives an amusing solution of trolleys for pedestrians across the streets.

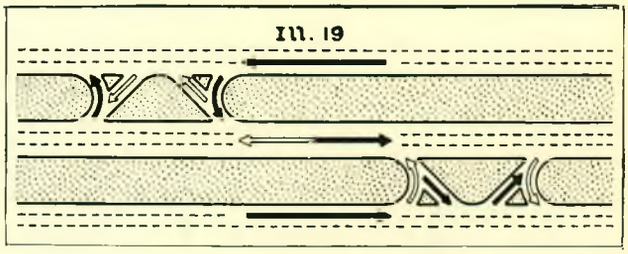
The British Ministry of Transport has lately issued a system of "one stream" circulation of traffic at intersections which is a modified form of Malcher's ideas, though independently thought out.

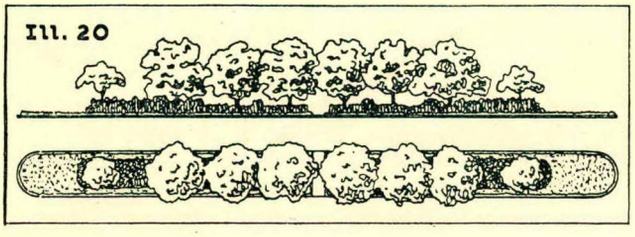
There are various types for different junctions, but the object sought is similar in both systems—to eliminate traffic lanes and streams crossing each other.

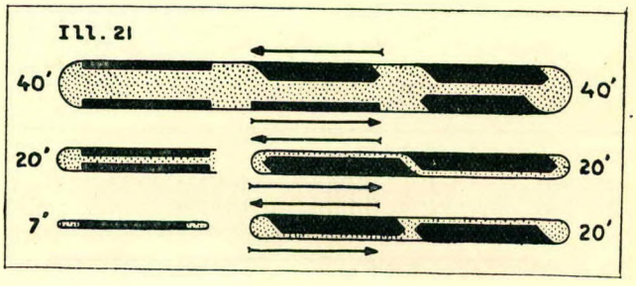


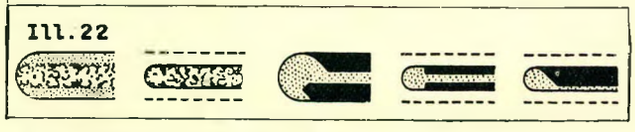


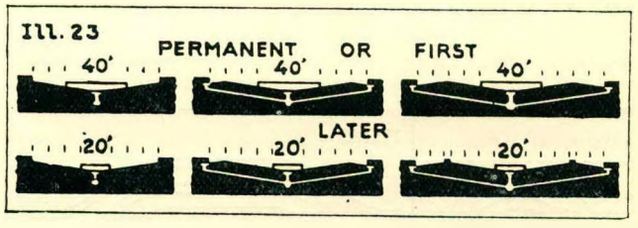












From "The American City."

Figure 4.

The last plan of this series shows what would be the evil of having more than two streets crossing if good spaces were not left between their mouths—a system which I am sorry to say has been adopted in some recent Johannesburg townships, which may lay up trouble in the future, and should be prevented under the new regulations under the Town Planning Ordinance.

Another method of securing the "one stream" policy is by the hexagonal or honeycomb system developed by Chauvon, which avoids all right angles, and the stream flows on easy bends from one part to another.

There is little doubt that the right-angle crossing of four streams at intersections as now adopted, should be eliminated, and main great roads laid down in future plans which by the protection suggested from cross roads would tend to stop such cross roads becoming themselves main lines as now so often happens, and is not provided for. Malcher claims that this system does not lead to more land use by streets than the old method.

The adoption of a "one stream" policy has begun in Johannesburg, in Joubert and Von Brandis Streets. The small blocks in the inner city would not make it difficult to adopt it more fully when it is eventually needed. It would then mean that on both east and west streets and on north and south streets every alternate street would be devoted entirely to "one stream" flowing in the same direction. No cross stream turns would be thus allowed and no wheeling round vehicles to change direction at intersections, the flow being all anti-clockwise. The streets being freed of opposing traffic streams would become safer and the extra length of travel compensated for by greater safety and probable saving of time through practically no stopping. Stop lanes for cars standing would probably be practicable in the narrow streets, if not on both, at least on one side, and spaces allotted for goods vehicles in each block not to be used by passenger motor cars. Pedestrians would be safer except perhaps where at present there are robots, but at these points, the absence of opposing streams and the lesser intensity of traffic would probably meet any apparent disadvantage. Owing to our numerous streets, our traffic problem is not intense but is troublesome from frequent intersections and consequent danger.

Acute Angle Intersections.

Acute angle intersections like St. Andrews Road and Jan Smuts Avenue and St. Andrews Road and Oxford Road, Parktown, are not as safe as right-angled intersections, and this is worst, curiously, where the line of vision is longest, i.e., across the obtuse angle. This danger arises from the "two stream" policy. The

reason for this apparent paradox is that vehicles coming down St. Andrews Road enter Jan Smuts Avenue inclined acutely towards traffic coming from their right hand and in case of danger cannot swing away from the right hand and away from the approaching right hand traffic so easily as vehicles coming in at a right angle. I receive so many complaints that a close study of this curiosity of planning makes me certain that acute angles should not be permitted at street junctions unless for a "one stream" system, and where diagonal roads are needed, they should enter a cross road at right angles.

Playgrounds and Park Systems.

Every city shou'd have a co-ordinate park policy, that is, it should not be haphazard or fortuitous or hand-to-mouth If possible, there should be a system on broad lines on a civic survey setting out probable requirements for the future population, and this should be kept to by the Council. There should be two or three main large-sized parks and main central playgrounds, but each district should be provided with set-aside space which should not be alienable by the local Council except for exchange for improvement in the same district. This city has been under much handicap owing to a complete policy not having been laid down by the Government which originated the Municipality for a co-ordinated process of parks. All our young folk need playgrounds, and a large fraction of the people need and use parks. These fractions should be ascertained as they can be from England and America, and I think it would show that the city would need more park and playground and more foresight in a well-considered plan. Adelaide (S. Australia) has provided a wonderful ring of parks around the central city several chains through. The main roads traverse this ring, but as the ring is inalienable it remains unbroken now for nearly 100 years, a most convenient and accessible land suitable for pleasure and play for all time.

High Buildings.

One of the functions of a city engineer is to see that people carry out the building regulations and of these there are important clauses about high buildings. These are limited to a maximum of one hundred and forty feet, or one and two thirds the street width. Too high buildings increase the traffic on the adjacent roads as the people using a many-storied building are many times greater in number than in a low building. Many of these folk use motor cars or even if they walk it tends to congestion of traffic. Except to its owner, the high building has little to commend it to the average citizen, except that it is spectacular. The carrying up of buildings to excessive heights does not make for safety in the upper parts in case of fire and such become more and more difficult for the fire department, and the height makes for insecurity from the openings in case of conflagration than in lower buildings and even a low building on fire may easily assail the upper windows of an adjacent high building even across the street and embers escaping from a high building may be blown great distances. I sincerely hope that the city will tend to reason in this matter and will not permit the present generous height limit to be raised, for it makes a form of traffic congestion which would not be tolerated in a street in any other form. As an American writer has remarked; "you can't make a public speech in the street or turn your car the wrong way or dump a load of hay or stop to speak to someone else if ordered by a policeman to move on, but you can do far worse than a hundred hay waggons by erecting buidings tall enough, bulky enough and numerous enough so that the street cannot decently accommodate the resulting traffic, and may add the equivalent of twenty parades to a street's hourly business." Well, of course, such a thing is wrong and the Americans are beginning to find it so, and some are calling builders of high sky-scrapers "land hogs."

At any given time a city requires so much cubic feet of office and store space. It can get a lot of this by going up, including upstairs shops, which may come here yet, or it can get it by not going up so high and spreading and keeping down to good sense and not letting a few men run off with the light and air. In America bulk limitation is joined with height limitation.

America is altering its methods of late to avoid the tall dark and darkening structure and attain a better type by restricting the buildings.

Aerodromes and Air Plans.

Aerodromes are no longer matters of fancy but have become a necessity and every large-sized town cannot afford to neglect provision for air transport landings.

The aeroplane has also brought to practice an easy and inexpensive way of obtaining a topographical plan which will show with tolerable scale accuracy the buildings, streets and features of the city and such a plan becomes of immense value to the city planner.

Every town should have its district photographed to scale from the air and have the same done again, say, every five years, if the town is growing much, to bring in later alterations and additions of streets and buildings.

Summary.

The City Engineer will be seen to touch town planning in most of its phases; the land seller is naturally most interested in the total lot area saleable and the architect in the appearance and convenient site for his building, but the City Engineer is primarily interested in the street and drainage lines as well as beauty of result and is the man most aware of the results of bad planning of these matters, for it is to him complaints are addressed and he is the man who has to initiate and carry through any necessary amendment of plan. The subject given me is too vast for any detailed treatment and if I have only lightly touched on salient points, it is due to the little time at my disposal.

I desire to thank Mr. J. B. Beans, Photo Service, for the excellent aerial photographs which he handed to me and which have just been exhibited to you."

Mr. Bawden expressed the thanks of the Meeting to Mr. Waugh for the very excellent address he had delivered which was especially instructive as regards traffic control; and declared the subject open for discussion.

Mr. Fitzsimons said all appreciated what the City Council was doing to improve traffic and build link roads. He felt it was a great pity that Town Planning was not recognised when the City was first laid out, as there would not have been such inadequate bridges and subways across the Railway and wider streets would have been provided.

Several questions were asked, and were answered by Mr. Waugh, and the meeting closed with a hearty votes of thanks to the lecturer, and to Mr. Bawden for presiding at the Meeting.

STRAY THOUGHTS ON ART.

by DENYS LEFEBVRE.

"Great works of art do not yield their secrets all at once; so the best way of understanding good pictures is to look at them again and again," says Sir Charles Holmes, in his useful book, "An Introduction to Italian Painting."

Another way is to put oneself under a competent guide such as Sir Charles himself. I know some artists may not agree. I have heard them smile, I use "heard" advisedly, at the idea of a mere layman attempting to take an intelligent interest in pictures, but the fact is that there are many competent lay critics in England and on the Continent to-day and that many an art collector has gradually come to acquire, not only fine paintings, but an intelligent and increasing joy in them. A joy by no means dependent on their monetary value, and which goes to show that though the painter is born, the collector, the dealer who knows and the layman who has a genuine appreciation can be made.

This, surely, is one of the uses of a public art gallery! If clever people are going to shut out all the pleasures of art from their less artistically endowed fellows, one of the reasons for the existence of art has gone. I like to think that Rembrandt painted not only because he had to, but also because he wished to allow other people to appreciate and share in his joy of creation. The people he most loved to paint were the common everyday people. There is something especially attractive, to artists and layman alike, I fancy, in the everyday subject painted by a master. Many of the greatest painters, perhaps the old Dutch masters in particular, but also Frenchmen such as Millet and Degas liked to take the common things of life and set them down, touched by the painter's magic, it is true, but still life-like and human. In our own day, Forain and Blampied, among etchers seem to me to carry on this tradition.

But I was talking about the Italian painters and Sir Charles Holmes has the gift of imparting enthusiasm to his readers. At the outset, he impresses on them the need of tolerance, and this because, as he points out, "each master delivers his message in the language of his own age and district." In other words, to get a real appreciation of Italian art, we must learn to appreciate the Primitives and from them trace the progress of painting in Italy to the masterpieces of Titian, Michael Angelo, Botticelli, Raphael and Leonardo da Vinci, only to name some of the more familiar of the Italian masters.

Forty full page plates help to explain the more apparent differences between the various Italian schools together with a short account of some of the better known technical processes. In this way one gets a hint about painting frescoes and the reasons why sometimes oil and sometimes tempera make suitable media of expression. In an occasional sentence, the author helps to elucidate many points that puzzle the man in the street:—

"When Uccello translates men, horses, trees and hills into geometrical terms, so that they look rather like wooden models in a box of toys or a Noah's Ark, the translation has one singular merit. It brings into harmony the various parts of the picture, so that, with all their individual oddities, they make a quite admirable decorative pattern."

"Botticelli's line moves with the litheness of a serpent or the swiftness of a flame."

"When Raphael is tired . . . he reverts to conventional postures and second-hand graces . . . as a colourist, he is experimental and not infrequently disagreeable. But the immense activity of his Roman years resulted in a certain number of works which, in their different ways, are masterpieces that have never been excelled." "Of Correggio," he says, "this happy pagan was a great painter."

He is intensely appreciative of Titian's "Bacchus and Ariadne. He says, "Inspired with the very spirit of paganism . . . the figures move and riot with a life that is more than human. Not only does it combine the utmost breadth and splendour of colour with the most precious expression of detail, but as sheer painting, it blends as no other work in the world has blended every device that knowledge and power can supply to the Bellinesque method."

Space will not allow of further quotations, but the author has the gift of enthusiasm and the even greater gift of imparting that enthusiasm to others. In his appendix, he gives the student valuable hints where he can study the great Italians by means of good prints, in addition to a useful list of books dealing with the subject, including of course, Vasari, as well as some more recent and popular writers. For those who wish to get a working knowledge of the pictures of the Italian masters, either as a preparation for a visit to Italy or because they are not even fortunate enough to see some of the originals in London, I can think of no book that will better serve the purpose indicated in its title.

SCHOOL OF ARCHITECTURE.

UNIVERSITY OF THE WITWATERSRAND.

ANNUAL EXHIBITION AND PRIZE GIVING.

The Sixth Annual Exhibition of students work and prize giving was held at the University on Thursday, September 4th, and was very well attended by a large number of Architects and Quantity Surveyors from Johannesburg and Pretoria.

Professor Pearse, after welcoming the visitors on behalf of the staff and students said:

"I am particularly pleased that we have with us this afternoon our Vice-President-in-Chief of the Institute of South African Architects, Mr. T. Moore, and the President of the Chapter of Quantity Surveyors, Lt.-Col. W. E. Puntis, also Mr. O. W. Staten, Secretary of Public Works, and Mr. Cleland, Chief Government Architect, who have just returned from London.

"In reporting on the work of the School for the year I should like to say at the outset that its progress on the whole has been fairly satisfactory, I say fairly advisedly as I am not altogether satisfied with the results of the years working. It may be that I am not easily satisfied, but I do not think I am too ambitious when I express the hope that this school will be the finest in the country and will produce students who will secure some of the large overseas scholarships now open to them.

"This all depends on the students themselves who, if enthusiastic enough, can achieve my ambition. As long, however, as the present somewhat apathetic attitude of students and, unfortunately, senior students exists it is bound to have an undermining effect on the rest of the school. Every school I suppose has its ups and downs and, in the past, and more especially at the commencement of our school we had some excellent material in those students who, in spite of the meagre equipment at our disposal, helped to bring credit to the school and attracted the notice of our profession.

"To-day with our excellent equipment we are lacking in that spirit of enthusiasm without which no School of Architecture can prosper.

"The numbers of our students have increased during the year. We now have twenty-eight degree students in Architecture.

"In the Diploma course in Architecture we have thirty in Johannesburg and twenty-six in Pretoria, a total of fifty-six.

"In the Diploma course in Quantity Surveying which only commenced last year, we have ten students in Johannesburg, and twenty-two in Pretoria, a total of thirty-two, a grand total of one hundred and sixteen students. During the year under review one student, Mr. R. D. Martienssen, obtained the Degree, and three students, Messrs. D. S. Haddon, C. J. Slade and N. M. Eaton, the Diploma in Architecture, and two, Messrs. C. L. F. Borckenhagen and W. A. McKechnie, the Diploma in Quantity Surveying. Last year, for the first time, we sent drawings to London for the Exhibition of work of the Schools of Architecture recognised for exemption by the R.I.B.A. from their examinations.

"It is gratifying to report that these drawings were very favourably commented upon. In his letter the Secretary states *inter alia*, 'The officers of the Board were very satisfied with the general standard of the work submitted and they think that the working drawings sent by Mr. R. D. Martienssen constitute a very competent piece of work."

Two of our students have distinguished themselves by winning scholarships during the year.

Mr. N. M. Eaton, who was a student here for three years and completed his course in Pretoria, won the Herbert Baker Scholarship of £300, for which there were eleven entrants, in fact all three candidates in the final competition were at one time students of this school. Mr. A. V. Nunn, one of the Pretoria students who left last year to complete his final year at the A.A. School of Architecture, in London, won the Henry Jarvis travelling studentship, awarded to fourth year students in that school.

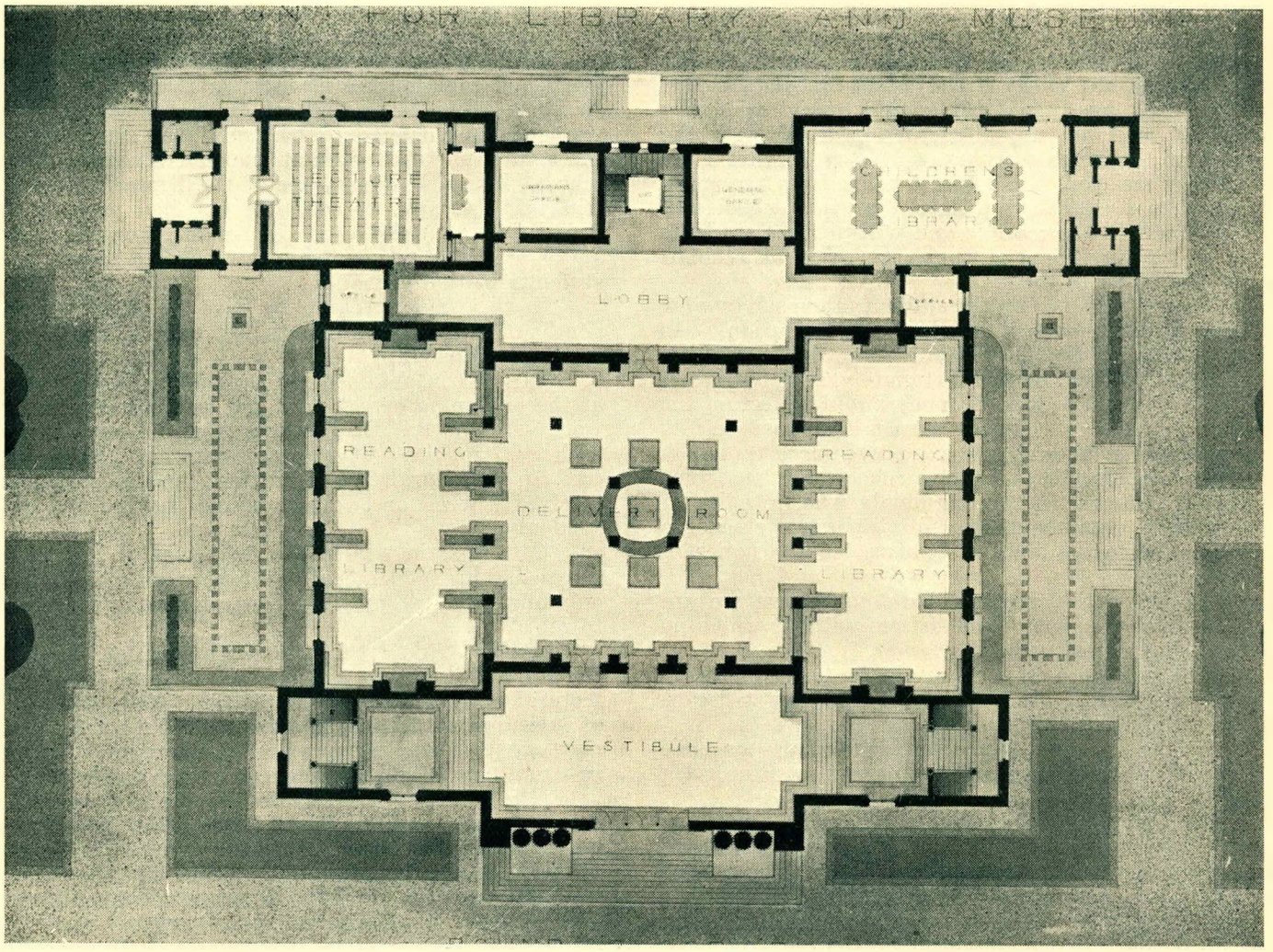
"I very much regret to have to announce the deaths of two of our students, Mr. L. R. F. Bustin and Mr. D. H. Epstein.

"Mr Bustin obtained his Diploma in Architecture at the beginning of last year and had just commenced work with the P.W.D., Pretoria, when he was afflicted with eye trouble. It was necessary for him to proceed to Edinburgh for treatment and a cable was received a week or two ago saying that he had died suddenly.

"Mr. Epstein was in the final year of his degree course and his sudden death yesterday morning, he was only buried yesterday afternoon, came as a great shock to all of us.

"During the year the Architectural Students Society was dissolved and has now become the Architectural Society of this University. With the object of extending its scope and activities its membership is now open to past students and any persons interested in Architecture and its allied arts and crafts.

"The newly formed Society held a successful dance in June, and the first lecture under its auspices was given by Professor Kirby last term. The success of such a society depends entirely on the wholehearted support of present and past students and members of the Architectural and Quantity Surveying profession and we hope that apathy will not bring about its decease, but rather that it will be a great factor in our professional life in the future.



A Library and Museum.
Fourth Year Design.

Witwatersrand University School of Architecture.

J. T. Jenkins.

"It is gratifying to be able to announce that the School of Architecture at the University of Cape Town has now obtained recognition of its courses by the R.I.B.A., and that the two Universities appointed as the Examining Authority under the Act have come to a satisfactory working arrangement for conducting the examinations for Architecture and Quantity Surveying in the Union. It is anticipated that in the near future R.I.B.A. examinations will be conducted without reference to London and that the Associateship of the R.I.B.A. will be awarded on the joint recommendations of the two Universities working in conjunction with professional boards of examiners.

"Thus all our examinations in the Union will be standardised.

"Last year, as you know, we established our Diploma Course in Quantity Surveying and it is gratifying to report on the splendid support accorded us by the Quantity Surveying profession. The Chapter of S.A. Quantity Surveyors has generously donated a gold medal to be awarded to the most distinguished student in the final year of the course and book prizes to the best students in the second and first years. These prizes are being presented for the first time to-day and it is hoped that the gold medal will be awarded in future at our graduation ceremony. The prizes to be awarded to Architectural students have been generously donated, as in the past, by Mr. D. M. Burton and the Transvaal Institute of Architects.

"Mr. Burton who has so splendidly supported our school in the past on every occasion has, during the year, generously donated £100 as an endowment fund for an annual prize.

"During the year we have had gifts of books from Mr. T. Moore and Mr. W. A. McKechnie and also a further addition to the fine collection presented to us by the Carnegie Corporation of New York. I should like to take this opportunity of thanking those who have assisted us during the year in a part time capacity —Professor Bell John, Professor Armstrong, Mr. R. A. Bruce and Mr. K. E. F. Gardiner.

"The Pretoria classes in Architecture and Quantity Surveying are steadily taking shape in spite of lack of equipment and suitable accommodation, nevertheless the work turned out by them, as you will see from the Exhibition, reflects great credit on those in charge.

"In this respect I should like to thank Professor Bell John, Miss G. Anderson, Mr. A. F. Lawrie, Mr. W. G. McIntosh, Mr. G. R. Whale and Mr. Dohse, all of whom have had an uphill task in the establishment of these classes on a proper basis.

"I am glad to say that two of the prize winners to-day, including the gold medallist, are Pretoria students—Johannesburg students, look to your laurels.

"Before asking Col. Puntis to present the prizes, I should like to pay a tribute to the splendid work he has done in the interest of Quantity Surveying education."

Col. Puntis then presented the prizes to the following students.

In Architecture :—

First Year, First Prize : Mr. F. F. Freeman (Johannesburg).

Second Prize : Mr. W. Blaker (Johannesburg).

Second Year : Mr. B. S. Cooke (Johannesburg).

Third Year : Mr. J. T. Jenkins (Johannesburg).

Fourth Year : Mr. S. H. Todd (Pretoria).

Burton Prize (presented to the best all round student in any year) : Mr. J. Fassler.

In Quantity Surveying :—

The Gold Medal (awarded to the most distinguished student in the final year) : Mr. C. L. F. Borckenhagen (Pretoria).

Second Year : Mr. J. S. Hodge (Johannesburg).

First Year : Mr. E. V. Kohler (Johannesburg).

Col. Puntis in addressing the gathering expressed his appreciation, on behalf of the professions of Architecture and Quantity Surveying, on the work being carried out by members of the staff in Johannesburg and Pretoria and congratulated the students on the work exhibited.

Mr. T. Moore, Vice-President-in-Chief then addressed the students as follows :

In the absence of our President-in-Chief, Mr. W. Hawke, of Capetown, I have been asked to address you at this Annual Prize-giving.

It is a great honour and one I much appreciate. My address will be very brief as I am sure you are all anxious to examine the Gold Medal and other Prizes just presented by Col. Puntis. I must congratulate those who have received prizes and sympathise with those who have not—personally I never took a prize.

I must impress upon you as Students, that your studies at the University and the obtaining of a Diploma or a Degree, does not mean that you are competent to practise your profession. You have still to learn to adapt the knowledge acquired in the classes to this purpose.

While still studying you should consider seriously what you are going to do when your Diploma or Degree has been obtained and this, plus your five years experience, entitles you to Registration or Enrolment.

If you decide upon the practice of your profession, then take my advice, and after serving your articles, try and put in some two or three years in the office of an Architect or Quantity Surveyor in established practice.

If, however, you feel more inclined for the Public Service, then you should enter it as early as possible after your studies are complete. But bear in mind that if you enter the Public Service, although there may be more immediate financial benefit, you cannot learn the *Practice* of a profession in this way ; by this I mean, you will learn how to do your work in the Public Service but you will not learn the Practice side of it.

It gives me pleasure to inform all the Students that the 1930 Year Book of the Institute of South African Architects and the Chapter of South African Quantity Surveyors, will be published in the course of a few days—a copy will be sent to each registered Student and my advice is that you read every page of the book. It is full of items of interest. This year it will contain a complete list of all the Students registered by the Education and Examination Standing Committee on behalf of the Central Council.

The Students in Quantity Surveying will be pleased to know the Second Edition of the Standard System of measuring Builders Work in South Africa is now in print and the Board of the Chapter hope to publish the book in the course of the next two or three weeks ; also to know that it has been decided to publish this, to Students, at five shillings. This

is a Technical book of the greatest value to Students in Quantity Surveying and should be carefully read from cover to cover.

Another important document, for all Students, is "The Conditions of Contract." For some considerable time, "The Standard Conditions of Contract" published in 1921 has been acknowledged, by all parties concerned, to be wanting revision. There have been meetings of Delegates representing the Federation of Master Builders, Institute of Architects and Chapter of Quantity Surveyors, and a revised document has been provisionally agreed upon and it is quite probable that by the end of this year the document will be accepted by the parties as being fair in the interests of all concerned. A knowledge of contract is essential to both Architects and Quantity Surveyors more especially if in private practice.

I should be failing in my duty if I neglected to mention Mr. Robert Howden, the Immediate Past President-in-Chief of the Institute and Colonel W. E. Puntis, The President of the Chapter. It is only in time to come that Students will really recognise the great debt they owe to these two, Mr. Howden as a member of the Executive Committee, which secured for the Architects of the Transvaal Registration under the 1909 Act; as a member of the Executive Committee responsible for the passing of the 1927 Architects and Quantity Surveyors Act; then as a member of the Inaugural Board which Board drew up the Regulations under the Act, and later as a member of the Central Council and First President-in-Chief of the Institute and Chairman of the Education and Examinations Standing Committee Mr. Howden has devoted some quarter of a century to advancing his profession in South Africa. Col. Puntis has also as President of the Chapter—as alternate on the Inaugural Board for the Government Architect and as Government Nominee on the Central Council and a member of the Education and Examination Standing Committee, devoted years of his life to the benefit of his profession in this country.

You as Students are now reaping the benefit of these labours—labours most unselfish and selfsacrificing—but later on as practitioners in your respective professions you will really come to understand how much they have done for you.

In Professor Pearse, you, as students, have had one who has devoted heart and soul to his work. After some years of association with him, I can, from experience tell you that he has done more for students in Architecture than any one else, and you can imagine the pleasure it gives me to see the number of students increasing each year and the additional facilities given by the University in recognition of the fact that Professor Pearse has established the profession on a proper basis.

Professor Harry Bell-John has done wonders in organising educational courses for Quantity Surveying students. By referring to the 1930 Year Book of the Institute you will see a list of these students, and when you remember that two years ago there were practically no educational facilities for young people anxious to adopt Quantity Surveying as their profession, you will appreciate the whole-hearted way in which Professor Bell-John has carried out his work.

In conclusion I may mention that more and more is the tendency growing in the Union to recognise that want of understanding between the Architect and the Quantity Surveyor must not only be a serious thing for the building employer and the Building Industry through the misunderstanding it causes, and, more and more you must come to the conclusion as between ourselves that you are not and must not be antagonistic to one another but rather that it is in both your interests to work together for the benefit of all concerned. You must remember that your entry into a profession gives certain privileges but it also entails certain responsibilities. Do not commercialise your calling; remember to learn the traditions of your honoured profession; do not trouble to acquire, what one might term, the tricks of a trade.

PROFESSIONAL NOTES AND NEWS.

Obituary.

It is with deep regret that we have to record the death of Mr. Allan Stratton, at the Arcadia Nursing Home, Pretoria, from double pneumonia. Mr. Stratton was a prominent official in the Public Works Department, a member of the Chapter of South African Quantity Surveyors, and of the Transvaal Provincial Institute of Architects.

In 1902 he was appointed by the late Sir Aston Webb, P.R.A., on the recommendation of Mr. T. Moore, together with five others, to form the Quantity Surveying Branch of the P.W.D., Transvaal and was the youngest of those chosen. Prior to that he was in the office of Mr. A. G. Gross, F.S.I., now president of the Quantity Surveyors' Committee of the Surveyors Institution of Great Britain, and Quantity Surveyor for the new South Africa House, London.

Mr. Stratton came to South Africa in December, 1902, and his progress in the Department was unusually rapid. He had for some time held a senior post in the Quantity Surveyor's branch in 1925, when he was seconded to superintend the demolition and reerection of a sugar-mill at Umfolozi, Zululand, a job which took nearly three years, and cost some £20,000.

On his return to the Transvaal he was appointed First Grade District Engineer Johannesburg, in recognition of his services and of the capable manner in which he had performed his duties at Umfolozi.

At the end of 1929 he was appointed Chief Assistant Quantity Surveyor for the Union, a position he held till his death at the early age of 47.

Mr. Stratton became a member of the Transvaal Society of Quantity Surveyors, 1905, and subsequently a Vice-President of the same, and was also a member of the Sub-Committee which drew up the Standard

system of Measuring Builders Work in South Africa which was published in 1913, and alternate to the Chief Government Quantity Surveyor on the Central Council of the Institute of South African Architects.

He was also a member by examination of the Quantity Surveyor's Association of Great Britain, and passed the first and second Civil Service Law Examinations.

In addition to his official duties Mr. Stratton saw considerable military service. He was in the 26th Middlesex (Cyclists) Volunteers in the Old Country, and in this country joined the Transvaal Scottish, and later the Pretoria Regiment.

He was on active service in German West, as Adjutant of the latter corps, and was awarded the Military Cross.

He then served in the East African campaign, where he nearly lost his life in hospital.

After the Great War, he commanded a Company in the Pretoria Regiment only resigning on being seconded to Umfolozi.

As a sportsman he was a keen golfer, and latterly a bowler.

He married Miss Muriel Fisher, of Pretoria, who, with their two daughters, are left to mourn his loss.

Mr. Stratton's kindly and genial personality had endeared him to his colleagues, as well as to the many with whom he was associated in business and sport, and his death will be felt keenly by them all.

His professional ability has left its mark on Quantity Surveying in South Africa.

We extend our deep sympathy to his wife and children.

We cannot help feeling that he might still have been among us, had not his health been considerably impaired by the East African campaign followed by the very trying climatic conditions at Umfolozi.

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His friends in Johannesburg will regret to hear of the sudden death on Saturday morning in Edinburgh of Mr. L. R. F. Bustin.

Born in Johannesburg twenty-six years ago, Mr. Bustin was educated at the Technical High School, Forest Hill, where he matriculated in 1922. He then joined Mr. E. B. Farrow, the well-known quantity surveyor, but soon afterwards, finding that his real bent was architecture, he joined the staff of Mr. Harold Porter, with whom he remained for some years, at the same time studying at the Witwatersrand University School of Architecture. Subsequently he joined Mr. Gordon Leith and later the firm of Kallenbach, Kennedy and Furner. Latterly he was with the P.W.D. (architectural department) at Pretoria. In 1928 Mr. Bustin obtained the diploma in architecture at the university and was preparing for his final A.R.I.B.A. examination when he was threatened with blindness. As local medical opinion advised a difficult and dangerous operation, he left at the end of June last for Edinburgh to consult Mr. Norman Dott, a young specialist who has acquired a European reputation in operations of this nature.

Only last week his friends received letters announcing that he was in the infirmary and anticipating a possible operation.

Mr. Bustin was extremely interested in his work and was specially well versed in its technical literature. He showed marked ability, more particularly in the practical details of his profession, and appeared to be just beginning a useful and successful career. His mother and three sisters reside on the Rand.

An extract from one of his last letters to a Johannesburg friend may be of interest as showing how a genuine love of his profession persisted to the end. London's size and bustle were a revelation to the young South African, but on nearing Thos. Cook's offices in Berkeley Square, he says: "The first building I saw was one that was illustrated in 'The Architectural Review,' so that I felt quite at home."

While awaiting the operation in Edinburgh his first impression was one of greyness, as was natural coming straight from a Johannesburg winter. He visited the Forth bridge ("fine piece of engineering") and Swanson ("where Stevenson wrote St. Ives"). "The War Memorial," he writes, "is a fine piece of work. The exterior, in my opinion, the best part of it. The interior in the Renaissance style which spoils it, the outside is Gothic. . . . It is a pity the Castle is so modernised . . . The houses in some parts of the town are all alike—neat, clean but very drab-looking."

Architecture always meant a great deal to him. A talk on some architectural topic would frequently transform a rather self-conscious manner into one of assurance.

After all, life is not all wasted that finds even brief self-expression. D.L.

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The death occurred on September 3rd, of Mr. David Harold Epstein. Mr. Epstein, a student at the University of the Witwatersrand School of Architecture, was in the final year of his course for the degree of B.Arch., and was attached to the office of Mr. C. Small.

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A very pleasing little ceremony took place at the Union Buildings recently, in the office of Mr. O. W. Staten, Secretary for Public Works. There were present Mr. Staten, Dr. Hjalmar Reitz, M.P., Mr. T. Moore, Vice-President-in-Chief of the Institute, Lt.-Col. W. E. Puntis, President of the Chapter, and Mr. J. S. Lewis, Registrar of the Institute.

On behalf of the Institute, and in the absence of the President-in-Chief (Mr. W. Hawke, resident at Capetown), Mr. Moore presented Mr. Staten and Dr. Reitz with their Certificates, framed, as Honorary Members of the Institute. Mr. Moore referred to the esteem in which Mr. Staten and Dr. Reitz were held, and how very highly valued were the services they had rendered to the professions of Architecture and Quantity Surveying in South Africa.

Col. Puntis expressed the great pleasure it gave him to present the Certificates on behalf of the Chapter, as a mark of appreciation and in recognition of the signal services willingly rendered to Quantity Surveying and the great interest aways taken in the profession.

Mr. Staten said it was one of the happiest occasions of his life to be thus honoured by the Institute and the Chapter, in both of which institutions he took a keen personal interest.

Dr. Hjalmar Reitz said he appreciated more keenly than words could convey, his election as an Honorary Member of the Institute and the Chapter. He wished to repeat what he had previously stated, that in all his experience he had never been associated with a more pleasant body of professional gentlemen than Architects and Quantity Surveyors.

Mr. Moore conveyed to Mr. Staten the Institute's appreciation of the help rendered to the Central Council by Mr. J. S. Cleland and Col. Puntis, the Government Nominees on the Council.

It was much regretted that Dr. S. F. N. Gie, Secretary for Union Education, who has also been elected an Honorary Member of the Institute and Chapter, was unable to attend, being out of town. His Certificates will be presented to him on a later occasion.

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The Central Council of the Institute, as a result of its experience in the administration of the Act, has recommended to the Hon. the Minister of Education certain amendments to the Regulations. The Minister has approved of these amendments and has duly had them "Gazetted" and laid on the table of the House of Assembly.

Following is a list of these amendments:

Regulation 21. Delete the words " and envelopes."

Regulation 36. Delete the words "absent from the Union" and insert the words "absent from, not practising in, nor having any interest in practice in, the Union of South Africa."

Regulation 65. Delete the words "received from members by the Provincial Institutes" and insert the words "due from members to the Provincial institutes."

Regulation 83. Between the words "other" and "Institute" insert the word "Provincial."

Regulation 86 (*a*). Delete the words "To improve and maintain the integrity and status of the profession" and insert the words "To improve the status and maintain the integrity of the profession."

Regulation 89 (*e*). At the end after the words "quantity surveyor" insert the words "or either an architect or quantity surveyor entering into partnership with a land surveyor or a corporate member of the Institute of Civil Engineers, the Institute of Municipal and County Engineers, the S.A. Institute of Engineers."

Regulation 89 (*p*). Delete the words "a practising" and insert the word "an."

Regulation 89. After paragraph (*w*) add the following new paragraphs:—

"(*x*) For an architect or quantity surveyor acting in a consultative capacity over work for which another architect or quantity surveyor is employed, and whose services are afterwards dispensed with, to carry out the work.

"(*y*) For an architect or quantity surveyor to enter into articles with a student or pupil who has not passed the Matriculation examination of the Joint Matriculation Board, or is not in possession of a certificate of exemption from that examination issued by the Board, until such student or pupil has been approved by the Standing Committee on Education and Examination."

Regulation 97 (*p*). Delete the entire paragraph and insert the following: " Where works are of such a character that percentage or other stated charges are clearly inapplicable, time charges shall be made at a rate of one guinea per hour or part thereof with a minimum charge of three guineas."

Regulation 98 (1) (*c*). Between the words "duplication" and "portions" delete the word "or" and insert the word "of."

Regulation 98 (5). Delete the word "completed" and substitute the word "contemplated."

Regulation 98 (6). Before the word "inapplicable" insert the word "clearly."

In the interests of the profession throughout South Africa, the Central Council has resolved that every Member of the Institute and the Chapter be asked to notify the Registrar, at the first opportunity, of the existence or contemplation of all Architectural Competitions, limited or otherwise, in South Africa.

The Central Council looks to every member of the Institute and Chapter for his assistance and co-operation in this matter.

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The Transvaal Provincial Committee is pleased to announce that the Transvaal Provincial Administration has accepted the principle of giving out Architectural work for Schools and Hospitals to private practitioners. A deputation from this Committee met the Administrator in June last and had a most favourable and satisfactory reception. They were informed that steps would be taken to notify all Hospital Boards that they must employ Registered Architects at the Scale of Fees laid down by the Institute's Regulations.

The Administrator also intimated his intention to recommend to the Provincial Council that they should appoint a Consulting Architect, who would not be required to carry out the work, but would act as the Architectural Adviser to the Council. It was also proposed to nominate a panel of Architects whose members would be called upon to do the work in rotation.

With regard to Architectural work being done privately by employees in the Public Service, the Administrator informed the deputation that steps were being taken to put a stop to this.

It is the intention of the Committee to go further with this question and it is hoped that Union Government Architectural work will in the near future be given out to private practitioners.

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At the instance of the Board of the Chapter, Local Committees have now been appointed at Capetown and Durban. Up to the year ending March, 1930, the Board consisted of twelve Members, two of whom were from Capetown, and one from Durban. In the interests of economy the Board decided to reduce its personnel from twelve to nine, and, in order to keep the coastal centres fully in touch with "headquarters," decided to appoint these two Local Committees.

On May 5th, 1930, a special meeting of local Members of the Chapter was held at Capetown, presided over by Lt.-Col. W. E. Puntis, F.S.I., President of the Chapter, and addressed by him and Mr. T. Moore, F.S.I., Immediate Past-President. Sixteen Members of the Chapter were present in all, and the suggestion to form a Capetown Local Committee was enthusiastically adopted The following Local Committee was elected at the meeting: Mr. H. G. Labdon, F.S.I., (Chairman and Convenor), Mr. R. S. Shepherd and Mr. E. Hustwick (representing the solely-practising Quantity Surveyors), Mr. W. A. Ritchie Fallon, A.R.I.B.A. (representing the dual-capacity Members), and Mr. N. Foulds (representing the salaried Members).

On July 5th, 1930, a special meeting of local Members of the Chapter was held at Durban, presided over by Col. W. E. Puntis, President. There were present in all ten members of the Chapter. In Durban also, the suggestion to appoint a Local Committee was enthusiastically adopted, and the following Local Committee elected: Mr. W. G. Thompson, F.S.I. (Chair-

man and Convenor), Mr. J. McEnanem and Mr. J. Reid (representing the solely-practising Quantity Surveyors), Mr. W. E. Langton (representing the dual-capacity Members), and Mr. M. E. Cornelius (representing the Salaried Members).

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The Board of the Chapter is now in a position to announce that the Standard System of Measuring Builders' Work in South Africa has been thoroughly revised and brought up to date. A special meeting of the Board was convened to deal with amendments suggested by the National Federation of Building Trade Employers in South Africa.

The Revised Edition is now in the hands of the printers. The first proofs have been received, and it is estimated that the new publication will be available for issue before the end of September, 1930.

The Revised Edition can be obtained on application to the Secretary of the Chapter, 91, Stanley, House, Johannesburg, at 10s. 6d. per copy, postage extra. The Board has decided that, in the case of Architectural and Quantity Surveying Students registered by the Institute, the Revised Edition can be obtained at the concessionary rate of 5s. per copy, postage extra.

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Johannesburg architects swept the board in the competition organised by the Bloemfontein Town Council in connection with the erection of a new Town Hall for the City.

The first prize of £500 was awarded to Mr. Gordon Leith, of Johannesburg; the second, £400, to Messrs. J. C. Cook and Cowen, Johannesburg; the third, £300, to Mr. Percy Eagle, Johannesburg; and the fourth, £200, to Mr. Leonard McConnell, Capetown.

At a special meeting of the Town Council, the recommendation of the assesor, Mr. W. Hawke, of Capetown, was unanimously adopted. The estimated cost of the hall is £150,000, while another £70,000 will be spent on furnishings and the beautifying of the grounds.

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A conference has recently been held dealing with amendments and additions to the Johannesburg Building and Drainage By-Laws. At this conference the Transvaal Provincial Institute of Architects was represented by Messrs. Allen Wilson, H. Porter G. M. Harrison A. J. Marshall and F. Raine. Several meetings were held and many amendments and additions were discussed These are now being submitted to the Works Committee of the City Council for consideration and when finally drafted they will be referred to the Provincial Institute for further discussion. It is anticipated that a standing committee will be appointed to deal with the many constantly recurring problems connected with our by-laws and, it is hoped, the Institute of Architects will be represented thereon. Our thanks are due to our representatives for the excellent work they carried out in connection with the conference and the amount of valuable time they devoted to it.

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The attention of members is drawn to the hazardous practice of allowing open fires of any description in lift or other wells or other dangerous places in buildings under construction. These fires are often left burning without due supervision and attention, and are considered to constitute a grave danger. It is suggested that all contractors be asked to take steps to stop such practices and to instruct their Foremen also to take such steps.

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Mr. R. A. Bruce has successfully passed the Final examination for the Associateship of the Royal Institute of British Architects.

Mr. W. Gordon McIntosh, of Pretoria, who obtained the degree of B.Arch. at the University of the Witwatersrand, has been elected an Associate of the R.I.B.A.

Mr. C. W. Brown, of the Public Works Department, Pretoria, who passed the special final examination of the R.I.B.A., has now been elected an Associate.

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The following have been admitted to membership of the South African Institute of Architects and entered on the roll of the Transvaal Provincial Institute: Mr. J. T. Lloyd, A.R.I.B.A., Mr. Alfred Snell, A.R.I.B.A., Mr. Rex. D. Martienssen, B.Arch., Mr. B. St. C. Lightfoot, Cape Town, June, 1930: Chapter, Mr. F. G. Yates, F.S.I.

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Members are advised that Mr. A. S. Pearse, the Secretary of the Transvaal Provincial Institute will be pleased to assist in the despatching of member's designs for competitions, or alternately members may despatch their designs in the name of the Secretary of the Transvaal Provincial Institute in which case the Secretary should be advised so as to be able to attend to any inquiries.

Several members competing for the Bloemfontein Town Hall competition delivered their designs at the Secretary's Office and these were sent in one consignment to Bloemfontein, thus saving considerable time and trouble to individual members.

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It is gratifying to report that Sir Herbert Baker, A.R.A., F.R.I.B.A., has been invested by His Majesty the King with the K.C.I.E. for his work at Delhi.

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Mr. W. G. Holford, who was educated in Johannesburg and was for a short time in the office of Messrs. Cowin, Powers and Ellis, Johannesburg, has had a distinguished career at Liverpool University. He has recently been successful in winning the Rome Scholarship in Architecture.

Mr. O. P. Lewis, a student at the School of Art, Durban, and a pupil in the office of Messrs. Cowin, Powers and Ellis, Durban, has been awarded the Emma Smith Scholarship of £500, and is shortly proceeding overseas.

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The Secretary of the Transvaal Provincial Institute would be pleased if anyone could furnish him with the addresses of any of the following members:

Messrs. R. Bullock, F. L. Dreyer, Louis Elk, J. W. Gaisford, J. C. Humphries, F. Hutchinson, J. F. Lambert, S. Lewis, C. T. Mitchell, R. S. Murdoch, J. A. Oxener, H. A. Reid, G. Rowe, A. H. Scholte, J. E. Simmons, A. J. Thompson, E. S. H. Williams.

Members are reminded that the closing date by which designs must be delivered to the Town Clerk, Johannesburg, for the Johannesburg Library Competition is December 19th, 1930.

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The Royal Institute of British Architects has decided to recognise the courses of the Capetown University School of Architecture for exemption from their Intermediate and Final examinations.

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Mr. O. W. Staten, Secretary of Public Works, and Mr. J. S. Cleland, Chief Government Architect, have recently returned from England, where they have been discussing the plans of South Africa House, to be erected in Trafalgar Square, London, with Sir Herbert Baker.

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A meeting of the Practice Committee of the Transvaal Provincial Institute with representatives of the Clay Manufacturers Association was held in July at which it was unanimously agreed to recommend the adoption of the R.I.B.A. Standard sizes of bricks throughout the Union.

This matter is now in the hands of the Central Council who have submitted the suggestion to the Cape, Natal and O.F.S. Provincial Institutes for their views.

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Mr. J. N. Cowin (son of Mr. N. T. Cowin, of Messrs. Cowin, Powers and Ellis), having passed the five year course at the Liverpool School of Architecture has been elected an Associate of the R.I.B.A.

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Year Book.—Copies of the 1930/31 Year Book of the S.A. Institute of Architects may be obtained from the Registrar or from any of the Provincial Institute Secretaries, at 2/6 per copy.

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Competition for Salisbury Town Hall.—Mr. Harold Porter, L.R.I.B.A., has been appointed Assessor for this Competition which is open to Architects registered in Southern Rhodesia.

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Benevolent Fund.—The Trustees, having had to meet several calls of deserving cases during recent months, earnestly request members to make donations to this fund so as to avoid encroachment on the capital amount.

THE PLUMB RULE.

by R. WILD.

Two of the essential things in building operations are to have all the works plumb and level. To do this you require a perfect plumb rule and also a perfect level. Now, as most of the stocks of levels are of wood, the same precaution in selecting suitable wood will apply to both.

The knowledge of the laws of how timber changes in seasoning is not generally understood. So that the first thing is to examine the building up of the tree during its growth. And it is quite as necessary for the bricklayer or the plasterer to know all about the nature of the wood. Taking the general conversion of a bulk of timber: In this case into so many one inch boards, there is only one or one on each side of the centre or heart that is most suitable—see Fig. 1.

You will notice in the centre board "a" that the rings run across the thickness of the board. The fine broken lines "b," seen running from the centre to the outside, represent the Medullary Rays, but they run through the width of the Board. These rays are in all timber.

The medullary rays are groups of cells that grow at right angles to the vertical cells of the rings with which they intermingle, and are distributed without any apparent order only in direction—radiating from the centre to the outside.

It would appear they are set in this position to prevent the inward pressure of the bark, from crushing the vertical cells too much; for this pressure is such that it gives the wood cells four flat sides, the one cell being pressed against the other, giving the appearance of a honey comb.

We are aware that timber does not shrink endways on account of the cells being end-ways up, and these medullary cells being set end-ways from the centre to the outside will act in a similar manner to the vertical cells and prevent any contraction from the centre to the outside. From this we may now understand why the centre board "a" in seasoning will only contract in thickness and not in its width.

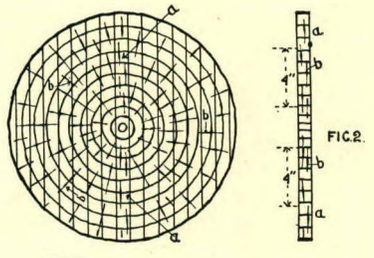

FIG 2.

FIG 1.

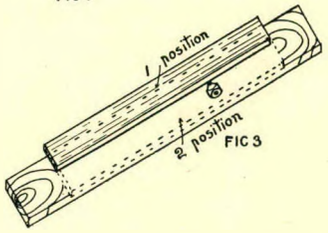

FIG 3

We now require a plumb rule, six feet long and four inches wide. We cut a piece from one of these boards "a." (Fig. 2.) Now shoot one edge straight and square. Before testing this edge set the plane iron very fine. You will find that though the shavings you took off at first were not what might be said, thick, yet there are high and low places along the edge and it will be necessary to run the plane over two or three times before you take a shaving from one end to the other. To test this edge to prove if it is straight, lay it flat on another board. Then with a sharp pencil, keeping close to the edge of rule, mark a line on the broad board the full length of the rule. (Fig. 3.)

Now turn over the rule with its other side flat on the board and on the other side of the line marked on the board. If on setting to the line there are any round and hollow places in this edge, they will be doubled when the edge is applied to this side of the line, indicating that the edge is not straight. But when this edge is perfectly straight and square, the pencil line will show a straight line when applied to either side of the line on the board, making a new line each time to be tested.

Now set a marking gauge to the easiest part of the width of rule. Then run the gauge the length of the rule, marking it on both sides. You now plane off the surplus wood down to the gauge marks, again setting the iron very fine for the final trimming up. You now require to go through this same process as at first, testing this edge from each side of a new line.. If it is perfectly straight and square the line will show equal all along the rule.

These two edges may now be perfectly straight but may not be exactly parallel the one with the other. To test this you now take a calipers, and with its legs—one on edge spanning the width of the rule—you gently draw them from one to the other, and if there is any slight variation and easy places in the width you will be able to feel them by the sense of touch as you draw the calipers along the two edges from one end to the other of the rule. If the sense of touch is equal along the length of the rule, the two edges are perfectly parallel with each other.

It might be thought that this process is too critical. But it is not if you want a perfect tool, and it is well worth the pains taken.

One might say, if it happens to get wet, on drying again it will be neither straight nor parallel. Providing there is no sap on either edge, it will dry perfectly straight and parallel.

All that is necessary to do now is to mark a gauge line down the centre of each side and cut out the hole for the plumb bob.

ACOUSTICS OF WOOD COMPARED WITH COMPOSITIONS AND FIBROUS MATERIALS

All woods are built up of long tubular cells like so many drums standing one on the end of the other. As the tree grows, there is formed what is known as the heart wood. These cells of the heart wood have now become dry and are no longer growing cells; they are empty—known as dead wood. When these were growing cells they were filled with sap. But there was another peculiarity—the fluid of each cell was connected to the adjoining cell by a fine fibre-like thread (a kind of nerve). If you were to pull off a leaf, it would be felt throughout the whole of the live cells.

Now, when the cells are full grown, and it is time for them to become heart wood, the cell dries up and the fibre-like nerve also dries; but where it passed through the walls of the cell there is left a small hole; so all the dried cells are connected by these small holes in each, thus—as they were—all connected during the life of the cell by the nerve fibre, so are they still connected by small holes in their walls when dry.

These small holes play a very important part in the acoustics of the wood. Trees of the Fir variety are the best carriers or reproducers of sound on account of the cells not being so dense and compact as the harder woods, though these are largely used for musical instruments which give them a more attractive appearance. These cells, as it were, stand one on the other like so many drums. Now all drums have a small hole in their case—they are not what you might say, airtight. If you were to strike the end of a drum that had no hole in its side, the sound would be dead, lifeless and would not vibrate the other end; it would be like trying to blow into a bottle—perhaps not quite as bad as that, well, take a tube or hollow vessel with a flexible end, then blow in at the other end—the flexible end won't vibrate. You might bulge the end through having increased the pressure inside. Now put a hole in the side. Then you will say; the air now escapes through that hole; but there is something more, the very pressure varies. Thus as the pressure varies so will the flexible end respond to the varying pressure. It is not only the end of the drum which is struck that vibrates, but the other end vibrates exactly the same—giving out the same tone. Now, the hole may be said to give flexibility to the ends of the drums: so you see how important the small hole is in the part it plays in all drums.

The drum-like cells of wood and the transmission of sound—If you said to a friend: "If I hold my watch at the end of this thirty feet long trunk of tree, and you put your ear on the other end, you will hear my watch ticking."—he might think it a joke. Yet, this is one of the tests made by experts for the soundness of trees as they come from the forests down to the sawmills to be cut up. Or, if you scratch the end of the trunk with a pin it can be heard at the other end.

It would be impossible to hear the watch ticking, or the scratch of a pin, thirty feet away—yet the sound is carried through the wood. The drum-cells repeat the sound, one to the other, with an increased volume.

Compositions.—Asbestos, Beaver Boards and other composition boards are mostly very compact, and thus devoid of any air spaces. Any sound striking their surfaces will rebound without penetrating or being absorbed in the body of the material. In the less compact material, the sound will penetrate deeper and will be absorbed, but will wander through the labyrinth of the various sizes of air passages, incapable of any repetition, and so becomes lost and dies.

Hair felt is very open and most absorbent, and the best material for the deadening of sound. I once used it for this purpose in office partitions. The framing was made in two halves or sides. The one half was fixed, then two thicknesses or sheets of hair felt was nailed, one on top of the other so as not to have a through straight joint. (On one side there was a long boarded passage. Even when the first layer was nailed on its deadening effect was noticeable, when anyone passed along the passage). Then the other side half was fixed in position—making it look like a solid framing. So in this case the felt was very open and full of air, but broken up with the hair fibres.

We may now conclude that the deadening properties of material is due to its absorbing and breaking up the waves of sound, thus destroying any possibility of

repetition by copy. In open wood the cells are like so many small drums, and any sound striking the surface of the wood will be repeated by the surrounding cells and so add their drum-like repetition, thus augmenting the sound, not destroying it.

In designing rooms for certain purposes, not only their dimensions should be studied, but also the purpose for which the room is to be used. Take a small hall, say in a Law Court, where you will have a great variety of persons who have to speak—Magistrates, Judges, Lawyers, Witnesses, etc. In a hall of this nature every care should be taken to avoid, as far as possible, using any materials that will have any deadening effect. Even the furnishings should be made of woods of good sounding properties, and not dead woods simply for ornament.

I was in a large lecture hall some time ago, where I noticed the desks and seats were not made of the best woods for sound repetition. Had this been considered both speaking and listening would have been improved. Take the construction of the various rooms in a library. Here, in contrast to the lecture Hall, you may now use all the deadening material you wish, for here you want quiet, no carrying of repetition of sound; everything wants to be dead.

The organ builder makes use of the soft open grained pines for his pipes for the heavy tone, not fancy woods. You get violins sometimes made of white deal —the most despised wood of the carpenter, who call it "Tiger," perhaps getting this name from the fact that when you burn it on the fire large burning pieces will fly out red hot, with a noise like a shot.

Some years ago I went into the workshop of a friend who was in the piano trade. There I saw a pile of 4½ in. x 3 in. x 4 ft. long white deals. I asked him what he used them for. He said the piano framing is made of them. I was surprised, and told him carpenters call that stuff "Tiger." He told me it was used for its musical properties. I mentioned this to one of the staff of a Piano workshop, when he said it was only used in "Common" pianos. Of course, he was upholding the dignity of the trade. We find it is often the case that the most despised will rise to the most sublime at the hands of the crafty fingers of a master, and vibrate with the touch of the bow like a creation worth thousands of pounds.

Semi hard and fancy woods are largely used by Musical Instrument Makers, often inlaid and most costly—of course it is a business with them.

There are myriads of conditions that go to detract from the success of acoustics of a Hall. Yet all possible means should be taken to let Nature's laws assist towards success and not to add defects. The size of an organ pipe and its tone are mathematical certainty—but the dimensions of a Hall with doors, adjoining rooms, passages and windows are not.